The semantics of complex demonstratives:

a defense of character theories

Doctoral dissertation

Ph.D. program in Logic and Philosophy of Science

Joan Gimeno Simó

Advisor: Jordi Valor Abad

València, September 2020

Acknowledgements

This dissertation deals with a very specific kind of expressions, complex demonstratives, but it does so from a wide range of perspectives, both philosophical and linguistic. This means that it has benefited from the expertise of many different people. In the first place, I would like to acknowledge the assistance from my advisor, Jordi Valor, whose guidance and careful comments have been essential to both the writing of this dissertation and my own personal development as a researcher. The very same thing could be said about Stefano Predelli and Derek Ball, who agreed to have me as a visiting student under their supervision during the two research stays I enjoyed while I was writing some papers that eventually became part of this dissertation. Their expertise in semantics and related fields helped me master many of the notions and topics that are central to this work, from demonstratives and compositionality to the semantics-pragmatics interface.

Albeit less directly, the current shape of this dissertation is also due to many conversations with countless people, including the members of the Valencia Philosophy Lab, my fellow Ph.D. students, several members and visitors of the Philosophy Departments in Nottingham and St Andrews, and many interesting philosophers and linguists I had the occasion to meet at the conferences I attended. My gratitude goes to all of them. The passages where I discuss the lying-misleading distinction, for example, have greatly benefited from the exchanges with Tobies Grimaltos, Sergi Rosell and the attendants to the *Lying and Deception* reading group that we had during one whole semester in Valencia. Similarly, my understanding of the framework employed in this dissertation is largely due to the discussions held at the *Semantics in Generative Grammar* reading group in Valencia, with participants like Jordi or Marc Artiga, as well as at other groups such as the *Language and Mind Seminar* in St Andrews or the *Edinburgh Philosophy of Language Group*, with whose attendants and organizers I had the occasion to discuss important linguistic and philosophical notions.

It is also worth mentioning Félix Bou's expertise in logic, which helped me grasp some of the basics of the field – not too imperfectly, I hope. Topics like indexicality and *de se* attitudes are also central to some parts of this work, and I owe much of them to extensive discussions with Víctor Verdejo. My office mates, fellow students and occasional co-authors

Marta and Saúl made the whole process more enjoyable. It was also pleasant to attend many of the conferences where some parts of this work were presented: the 5th Philosophy of Mind and Language Network in St Andrews, the 11th Semantics and Philosophy in Europe Colloquium in Warsaw, the 9th SEFA Conference in Valencia and the 21st Workshop on the Roots of Pragmasemantics on top of the mountains in Szklarska Poręba. The comments from the referees and audiences of these events were, in most cases, extremely helpful. I am also very grateful to the members of the examining committee for agreeing to review my work – a task that is always tedious and often goes unrecognized.

This dissertation was financially supported by the Conselleria d'Educació of the Valencian Government and the European Social Fund through the grant ACIF/2016/421. Extraoficially, however, my parents also provided financial support during the first year. A ells, i a tota la meua família, els agraïsc tot el recolzament rebut. Finally, I would also like to acknowledge the help from Laura, whose mastery of Romance linguistics and her suggestions to rephrase many passages made this work more empirically accurate and far easier to read. She suffered the writing process much more than I did. Muchas gracias a ti también.

Contents

1 Introduction

1.1 What are complex demonstratives?

Complex demonstratives have been among the concerns of philosophers and linguists since the first theories of reference were developed. Expressions like “this cat”, “that table”, “these elephants” or “those people” are the result of combining a bare demonstrative such as “this” or “that” with a nominal, thus yielding a syntactically more complex expression. In spite of this complexity, they share many semantic features with their bare counterparts, i.e., with singular terms like “this” and “that”. This similarity has led many philosophers to assimilate the former as a special case of the latter: bare demonstratives have been regarded as paradigmatic cases of singular referring terms since the work of Bertrand Russell (1911, 1918, 1948), and complex demonstratives, to a great extent, also seem to fit this schema. Thus, it is usual to conceive phrases of the form “that F” as singular terms whose only contribution to the proposition expressed is an individual; the role of the nominal “F”, in turn, is simply to secure the appropriate referent.

David Kaplan’s groundbreaking work (1977, 1978, 1989) laid the ground for a treatment of complex demonstratives along the lines of *direct reference*, on the model of other indexicals. Although he never stated a semantics for these expressions, he did devise an artificial operator, “*dthat*”, whose syntactic features closely resembled those of complex demonstratives, and which he intended as a device of direct reference. “Dthat”-terms eventually proved inadequate as a formal counterpart of complex demonstratives, but Kaplan’s general approach to indexicality did turn out to be extremely fruitful, and it was adapted for the particular case of complex demonstratives by authors like David Braun (1994, 2008a), Emma Borg (2000) and Nathan Salmon (2002). On these theories, the sole contribution of a complex demonstrative to the proposition expressed is just like that of any other indexical, namely an individual, and the role of the nominal is to a great extent analogous to the descriptive part of the meaning of expressions like “he”, “she”, or “that”. This means that a sentence like (1) below expresses a singular proposition, i.e., a content that incorporates an individual among its constituents. In terms of Russellian structured

propositions, this content could be represented as (1a), where *a* is some individual satisfying "being a man with a hat":

(1) That man with the hat is bald

(1a) <*a*, being bald>

This in turn means that the noun phrase attached to the complex demonstrative in (1) contributes nothing to the truth-conditions of an utterance of this sentence. Its role is rather to restrict the range of possible referents for the demonstrative, much like the feminine and singular Φ-features of the pronoun "she" help secure an appropriate referent but play no further role once this individual has been selected.

This way of dealing with complex demonstratives has become standard and, perhaps because of its intuitiveness, it is commonly assumed with little to no discussion. Other theories (cf. Dever 2001; Corazza 2002b, 2003; García-Carpintero 2006) depart from the Kaplanian orthodoxy in important respects, but they nevertheless manage to retain many of its central tenets. This traditional picture of complex demonstratives, however, is not uncontroversial, and it has come under attack during the last two decades. Many of the problems spotted in the core of the traditional theory have to do with the role attributed to the nominal and the right way to capture the singularity of the content of these expressions in an intensional semantics – similar tensions concerning the semantics of "dthat" were already noted by Kaplan himself in his own writings (1989). From a more empirical point of view, the recent literature has provided a vast amount of examples showing that complex demonstratives display *non-deictic uses* that do not fare well with the directly referential view.

All these problems led many authors to abandon the traditional approach to complex demonstratives and to propose alternative accounts in which they were treated on the model of quantifiers. For instance, Stephen Neale (1993), Jeffrey King (1999, 2001, 2008a, 2008b), and Ernst Lepore and Kirk Ludwig (2000) developed theories in which complex demonstratives are understood as quantifiers with a rigidifying element that accounts for many of the intuitions of rigidity that we usually have about these expressions. The debate between these and the above-mentioned authors is therefore somewhat analogous to the dispute between advocates of a quantificational treatment of definite descriptions, along the

lines proposed by Russell (1905), and those favoring a view of these expressions as singular terms, following the lead of Gottlob Frege (1891/1981a, 1892/1981b) and Peter Strawson (1950). Additionally, other authors working on the semantics of complex demonstratives have proposed alternative approaches that, in spite of not modelling them as quantifiers, have nevertheless abandoned direct reference and most of the analogy between complex demonstratives and the Kaplanian picture of indexicals. This is the case of Craige Roberts (2001), Paul Elbourne (2008) and Ethan Nowak (2014, 2019a, 2019b), among others. These theories and the quantificational ones are meant to handle all the data that the traditional approach is *prima facie* unable to deal with.

This dissertation is concerned with the semantics and, to a lesser extent, the syntax and pragmatics of complex demonstratives. And my aim is to defend the philosophical orthodoxy: my basic claim will be that, essentially, Kaplan and his followers got things right, and that none of the evidence cited by the authors championing quantificational and other non-traditional approaches to complex demonstratives justifies abandoning the traditional treatment. Namely, I will be arguing that the idea that complex demonstratives work as in the Kaplanian model of indexicals is essentially right, and that all the alleged counterevidence against a directly referential treatment of these expressions can be accounted for by means of the same mechanisms that explain the non-deictic uses of any other singular term, such as personal pronouns. Furthermore, I shall adduce new evidence strongly suggesting that complex demonstratives are better understood as indexical singular terms.

This defense of the traditional approach to complex demonstratives is structured in three parts. Section 2 provides an overview of the debate: I sketch the main motivations and tenets of the two main views in dispute, and I explain and develop the challenges that the defenders of quantificational accounts have posed to the traditional stance. Section 3 is the core of this essay: after introducing a couple of independently motivated adjustments into the traditional theories, I argue that these are able to tackle all the problematic counterevidence; namely, I show that, once we take into account some rather standard and well-established assumptions about natural language, the problems at issue vanish. Specifically, the required assumptions are two: a) that natural language has the expressive power of full object-language quantification over times and worlds, and b) that, *pace* Kaplan (1977), natural

language contains hyperintensional operators – what Kaplan himself called "monsters". I shall show that, once these two issues are taken into account, none of the challenges under discussion poses a serious threat to treating complex demonstratives as singular terms. My diagnosis will be that each of the non-deictic readings of these expressions can either be explained by the presence of a hyperintensional operator or be reduced as an instance of a problematic type of anaphora that occurs whenever there is *co-variation without c-commanding* – I shall explain all these notions in sections 3.3.2 and 3.3.4. And, importantly, these phenomena always result in non-deictic uses of *any* indexical, not just complex demonstratives. I also discuss some crosslinguistic evidence that favors such treatment (section 3.3.5.3) and connect my results to recent debates on notions like *direct reference*, *singularity* and *Millianism* (section 3.3.2)

Before continuing, let me state two *caveats* about my account. The first caveat is a worry: does it really matter whether complex demonstratives should be treated as quantifiers or as singular terms? There are two reasons why it may *prima facie* seem that it does not. On the one hand, many authors have dealt with both kinds of expressions on very similar lines; as a paradigmatic case, the father of modern semantics, Richard Montague (1974), gave the semantic type of quantifiers to all words traditionally considered as singular terms, and yet made very accurate predictions regarding their behavior. At least *prima facie*, the fact that singular terms can be modeled as if they were quantifiers seems to downplay the claims made here. On the other hand, even if some real difference between quantifiers and singular terms is in play, one may wonder why the problematic cases cannot be dealt with as cases of ambiguity. For instance, one could borrow Keith Donnellan's (1966) terminology and claim that complex demonstratives have both referential and attributive uses.

These worries are relevant and cannot be put aside; I shall address them, respectively, in sections 3.4.1 and 2.3 below. Let me sketch, for the moment, a brief response to each. I think there are important reasons, related to interpretability and raising, that can be adduced for rejecting Montague's suggestion that singular terms be given the semantic type of quantifiers. But, even if this idea were right, it does not undermine the claims made here: it simply means that there are many ways to model singular terms, and it does not entail that there are no differences between both kinds of expressions. My point is rather that, when it comes to phenomena like ellipsis, anaphora, cancellability, inference or indirect discourse,

complex demonstratives pattern together with proper names, indexicals and other expressions traditionally considered as singular terms, instead of belonging to the same category as "all men", "some people" or "most kids". As for the second of these worries, the discussion in section 2.3, which essentially follows Nowak (2014), presents some crosslinguistic evidence showing that the problematic cases cannot be regarded as instances of ambiguity. To my knowledge, few defenders of a directly referential account have payed the due attention to this counterevidence.

The second *caveat* has to do with an important distinction between three notions that are central to this dissertation: singularity, direct reference and rigid designation. The aforementioned tension in Kaplan's writings has to do with these notions, and particularly with the collapse of direct reference and rigid designation in an intensional framework. Furthermore, I believe that many of the arguments offered against the traditional view are flawed because they do not pay the due attention to the distinction between these three notions. Namely, these arguments follow a certain pattern: some author comes up with an example of a complex demonstrative that does not designate rigidly, infers that it cannot be directly referential either, and then she concludes that it cannot be a singular term, henceforth justifying a quantificational treatment. But the second step of the inference is unjustified: as I explain in section 3.3.2, and as many authors (cf. Salmon 2006a, 2006b) have stressed, the fact that a term displays non-referential uses does not entail that it should not be treated pretty much as in the Kaplanian model of indexicals, i.e., as a context-dependent singular term that is not sensitive to modal quantification. And, just to make it clear, what I intend to vindicate here is not direct reference, but *singularity* and *indexicality*; after all, my account makes extensive use of Kaplanian monsters, which are usually thought to be incompatible with direct reference. As we shall see, singularity and direct reference come apart in many expressions, perhaps paradigmatically in variables and personal pronouns.

Finally, the reader should bear in mind that, although my discussion concerns complex demonstratives in general, my focus will be on *singular complex demonstratives*, i.e., on "this F" and "that F" rather than "these F" and "those F". Throughout this dissertation I will expand my framework in order to cover plural complex demonstratives, but the semantics provided for these expressions should be understood rather as an initial hint, a suggestion that certainly

should be amended in order to cover more problematic cases. Since my aim is to defend that complex demonstratives should be understood on the model of pronouns, the differences between "that F" and "those F" may be thought of as analogous to those between "I" and "we" – meaning that any complications that plural pronouns may raise should be treated analogously.

Before we proceed, it is convenient to introduce some notation and to briefly state the framework from which I will be working, i.e., that of formal semantics in the generative tradition. This task is carried out in the next subsection.

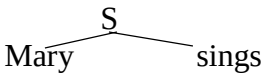
1.2 Some methodological remarks

Semantics is the study of linguistic meaning. A well-established field within this discipline is *compositional semantics*, which studies how the meaning of complex expressions is derived from the meanings of its component parts, as opposed to *lexical semantics*, which focuses on the primitive items of the lexicon. In order to model meanings, compositional semantics makes extensive use of model-theoretical tools and other resources from mathematical logic; for this reason, it is also often referred to as "formal semantics". In spite of being primarily concerned with complex expressions, formal semanticists have also made attempts to employ their tools for characterizing the meaning of some primitive expressions, particularly of those expressions that play a grammatical role, such as pronouns, logical connectives and verbal morphology.

Semantics in this sense can be seen as a continuation of the tradition initiated by Frege for the study of formal languages, subsequently adapted by Montague for the study of natural language and currently incorporated as another field of generative grammar by the likes of Barbara Partee. The framework I will be using in this dissertation is basically an intensional version of the standard theory as presented in Irene Heim and Angelika Kratzer's textbook (1998), which models the meanings of expressions by associating each of them with an abstract object, usually a function defined by means of *typed lambda calculus*. This dissertation presupposes familiarity with this system, so I will not elaborate on it much further; let me just sketch a brief reminder of the notions employed. In this framework, the input to semantic interpretation are syntactic trees, and the meanings of complex expressions

are calculated by means of *functional application*, i.e., by saturating a function with an argument. Let us see an example:

(2)



The semantic value of a proper name like "Mary" is an individual, namely Mary herself; using ⟦ ⟧ as the function assigning to each expression its semantic value, we may simply say that ⟦Mary⟧ = Mary. On the other hand, the semantic value of "sings" can be modeled as a function ranging over objects and returning one truth-value or another – truth or falsity – depending on whether they sing: ⟦sing⟧ = λx. x sings. In turn, the semantic value of the whole sentence is a truth-value, and it is obtained by saturating the function denoted by "sings" with an appropriate argument, i.e., with Mary. Thus, (2) is true if Mary sings and false if she does not: ⟦Mary sings⟧ = 1 iff Mary sings, and 0 otherwise. Let us formulate an official definition of this principle (Heim & Kratzer 1998: 49):

> FUNCTIONAL APPLICATION (FA) (to be revised): If α is a branching node and {β, γ} the set of its daughters, then α is in the domain of ⟦ ⟧ if both β and γ are and ⟦β⟧ is a function whose domain contains ⟦γ⟧. In that case, ⟦α⟧ = ⟦β⟧(⟦γ⟧).

This system is extensional, i.e., semantic values of expressions are objects and sets of objects (or their characteristic functions); paradigmatically, sentences simply denote truth-values. Intensional frameworks relativize these extensions to several parameters, notably possible worlds, among others; for instance, on the standard intensional semantics by Heim & von Fintel (2011), which builds on and expands Heim & Kratzer (1998), extensions are relative to a possible world and an instant of time. Since these two are the same arguments that intensions take in Kaplan's framework, which will be extensively discussed throughout this dissertation, let me settle for these parameters and define intensions as functions from times and worlds to extensions. So let us from now on refer to any tuple $i = \langle w_i, t_i \rangle$ consisting of a time and a world as a "*circumstance*", where w_i and t_i are, respectively, the world and the time of *i*. Thus, $[\![p]\!]^i$ represents the extension of expression *p* in circumstance *i*; abstracting over the circumstance yields the *intension* of the expression: $\lambda i.\ [\![p]\!]^i$. Let us also adopt an

additional principle for dealing with expressions that require combining with an intension, such as modal operators and propositional attitude verbs (Heim & von Fintel 2011: 11):

> INTENSIONAL FUNCTIONAL APPLICATION (IFA): If α is a branching node and {β, γ} the set of its daughters, then, for any circumstance *i*: if $[\![\beta]\!]^i$ is a function whose domain contains λi. $[\![\gamma]\!]^i$, then $[\![\alpha]\!]^i = [\![\beta]\!]^i (\lambda i. [\![\gamma]\!]^i)$

This principle ensures that, whenever one of the nodes requires combining with the intension of an expression, it will be fed the appropriate value; every other expression (logical operators, the usual predicates, etc.) may just employ a variant of FA as their combination principle:

> FUNCTIONAL APPLICATION (FA): If α is a branching node and {β, γ} the set of its daughters, then α is in the domain of $[\![\ ]\!]^i$ if both β and γ are and $[\![\beta]\!]^i$ is a function whose domain contains $[\![\gamma]\!]^i$. In that case, $[\![\alpha]\!]^i = [\![\beta]\!]^i ([\![\gamma]\!]^i)$.

Another option is to use only IFA and to adapt the lexical entries of every item so as to work with intensions all the way (we could devise, e.g., intensionalized versions of "all" and "or"). For simplicity's sake, I opted for using this mixed system. The reader should bear in mind three provisos about this framework.

The first proviso is that every now and then, and for purely expository reasons, I will be switching from this intensional setting to a system employing structured propositions, much like Kaplan (1977) himself does. The reason for doing this is that these systems are for the most part equivalent, and representing propositions as structured entities provides a simpler and clearer way to state certain claims. Secondly, I shall eventually introduce further parameters alongside instants of times and possible worlds; namely, the values to which extensions will be relativized are those of Kaplan (1977): a context, an assignment function, a world and a time. These will be introduced in section 2.1.1. In the third place, my use of this system is temporary: in section 3.3.1.2 I will drop it in favor of an extensional one, for reasons that shall become clear in that very section.

Finally, it is worth saying a word about the inputs to semantic interpretation, i.e., syntactic trees. The common assumption in the generativist tradition is that surface structures of sentences like "Mary sings", or trees representing these sentences annotated with syntactic

categories, are not yet an appropriate input. There is a further layer of syntactic analysis in which these sentences undergo several transformations related to structural disambiguation and determination of quantifier scope; the output of these transformations is a fully disambiguated *logical form* (LF) (May 1977, 1985; Chomsky 1986, 1995/2015; Hornstein 1995). These syntactic constructs contain everything that is interpretable and nothing else, and they are the inputs to the semantic operations. They are usually represented as syntactic trees, although for typographical reasons I will often employ simpler constructs, occupying a single line in the body of the text, whenever the syntactic relations among the constituents of an LF are either obvious or irrelevant.

So far this was the basics for setting the framework employed in this dissertation. Throughout the following sections I will introduce some additional terminology and state a few other methodological remarks whenever necessary. Let us now, then, move on and set the basics for the debate by presenting the two conflicting views.

2 The two approaches

This section is devoted to introducing the central tenets of the two main views in dispute. I begin by presenting the directly referential account of indexicals introduced by Kaplan and the way it was subsequently adapted for dealing with complex demonstratives. Then I present the criticisms and positive proposals advanced by the advocates of quantificational accounts, focusing mainly on the theories by Lepore and Ludwig (2000) and King (2001). Finally, I devote a brief subsection to arguing that this counterevidence cannot be dealt with as a case of ambiguity, as many champions of the directly referential view do.

Just for the ease of exposition, let me introduce a label for each of these approaches. From now on I shall use the obvious term, "quantificational theories", for referring to proposals that treat complex demonstratives as a special kind of quantifiers; these are discussed in section 2.2. As for the Kaplan-inspired theories, however, the label is not so obvious. In principle, all the proposals I will be discussing in section 2.1 can be appropriately called "direct reference theories", but this label should be used cautiously, for my own approach is a variant of these views and yet, as I stated above, I do not intend to vindicate direct reference nor rigid designation, but only singularity and indexicality. The discussion in section 3.3.2.2 should make clear that a system like mine, which makes extensive use of Kaplanian monsters, is not as incompatible with the notion of *direct reference* as it might *prima facie* appear to be; let me therefore settle for this label, notwithstanding the fact that its appropriateness is a matter of debate.

2.1 The classical account: direct reference theories

In this subsection I explain the central ideas of directly referential approaches to the semantics of complex demonstratives. These theories regard these expressions as just another kind of pronoun whose only role is to select an individual from the context, and most of them are in some way or another based on Kaplan's (1977, 1978, 1989) influential – though diverging – proposals. They also have a strong intuitive appeal. Being directly referential amounts to contributing an object to the proposition expressed, which means that the semantic value of such expressions cannot be altered once it has been fixed. This inability to

be affected by, say, modal and temporal operators is a trademark of direct reference, and it can be used for testing whether an expression should be treated as such. Consider the following contrasts:

(3) The first man in space could have been American

(3a) Yuri Gagarin could have been American

(4) The president of China will visit Japan

(4a) Xí Jìnpíng will visit Japan

Sentences (3) and (4) display an ambiguity that their counterparts (3a) and (4a) lack. (3) may be read either as a claim about Gagarin's nationality or as a stating the possibility that the United States got advantage over the Soviet Union in the Space Race. Similarly, (4) can be understood either as a claim about Xí – namely, that there is a moment in the future in which he will visit Japan, perhaps when he is not the president of China anymore – or as a purely general claim to the effect that in the future there will be a president of China that will visit Japan. These readings are respectively called *de re* and *de dicto*, and only the former is available for sentences containing directly referential terms such as the proper names in (3a) and (4a). This is so because temporal and modal operators like "will" or "could" operate on propositions, and the contribution of a directly referential term to the proposition expressed is just an object. Quantifiers, in general, exhibit differences in scope that directly referential terms are not subject to; e.g., sentences (5)-(7) all display ambiguities of this sort:[1]

(5) Every book in store could have been sold

(6) Most kids in this school will someday meet Obama

(7) John believes that a European city has a population of over 20 million people

[1] Just for the sake of clarification, let me state each of the readings available for these sentences. Much like (4) above, (5) can mean either that every book *x* currently in store is such that there is a possibility that *x* has been sold (perhaps in another store) or that there is a possible world *w* such that all the books the store contained in *w*, which need not coincide with the actual ones, were sold. (6), on the other hand, may mean either that the majority of kids currently in this school will someday meet Obama – say, because they will become politicians – or that Obama is planning to visit the school and most of the kids then in school will meet him (the latter reading says nothing about the kids currently in school). Both readings of (7) attribute to John a false belief, but one of these beliefs is *de re* (John could believe of London, Rome or Lisbon that they are more populated than they actually are) and the other one is *de dicto* (John could believe that the European population is less disperse than it actually is).

Indexicals are special in this respect: even though they have some sort of descriptive meaning, they also display a behavior akin to that of proper names when it comes to matters of scope. For example, a sentence like (8) exhibits the usual ambiguities, yielding both a contradictory and a contingent reading. For a sentence like (8a), however, only the latter reading is available, in spite of the descriptive meaning of "I" being roughly like that of "the speaker":

(8) The speaker could be not speaking

(8a) I could be not speaking

To put it otherwise, and in Kaplan's words, "*indexicals always take primary scope*" (Kaplan 1977: 510); as we shall see later, his framework is meant to capture these facts about indexicality.

At least *prima facie*, complex demonstratives neatly fit the pattern of indexicals, i.e., they have a descriptive content that helps fix the referent, but this content cannot be affected by external operators. Sentences like (9)-(10) do not display the aforementioned ambiguities:

(9) That bald man could have had hair

(10) Tomorrow that married woman will be single

These sentences have no contradictory reading: "bald man" and "married woman" take wide scope over the intensional operators "could" and "tomorrow", and remain therefore opaque to modal or temporal quantification. To be sure, (9) is not expressing the possibility that a certain man display at once the mutually exclusive properties of being bald and having hair; rather, it says of an actually bald man that he could have had hair. Similarly, (10) does not state that tomorrow a woman will be both married and single, but rather that a woman who today is married is becoming single by tomorrow. Something similar occurs when complex demonstratives are placed under the scope of attitude verbs; e.g., there is no reading of (11) in which Mary is attributed a contradictory belief:

(11) Mary believes that that bald man has hair

Analogous remarks can be made with respect to issues like inference, analyticity and cancellability. Finally, I would like to discuss two additional kinds of evidence that have been

somehow passed over in the semantic literature. These are anaphora and ellipsis (Higginbotham 1988):

(12a) Laura hates the man sitting by her side, but Julia loves him

(12b) Laura hates that man sitting by her side, but Julia loves him

(13a) Laura hates the man sitting by her side, and Julia does too

(13b) Laura hates that man sitting by her side, and Julia does too

There is a stark contrast between (12a)-(13a) on the one hand, and (12b)-(13b) on the other. There are two different ways to resolve the anaphora in (12a): Julia may love the man sitting by Laura's side or the man sitting by her own. These two readings are called respectively "strict" and "sloppy", and only the former is available for (12b): it can only mean that Julia loves the man sitting by Laura's side. Analogously, the ellipsis in (13a) can be resolved by attributing to Julia the property of hating the man sitting by Laura's side or the one sitting by her own, but only the former, strict reading is available for (13b). These facts call for an explanation and a *prima facie* plausible hypothesis is that complex demonstratives, in spite of being syntactically complex determiner phrases, are nevertheless not quantifiers but a special type of pronouns. This hypothesis suggests itself insofar as ellipses and anaphoras are subject to both sloppy and strict resolutions when their antecedent is a quantified phrase, as in (14)-(15), but only strict readings are available when such antecedent is a pronoun, as in (16)-(17):

(14) Laura despises every man she knows, and Julia does too

(15) Laura despises most men that she knows, but Julia loves them

(16) Laura hates him, and Julia does too.

(17) Laura hates him, but Julia loves him

Directly referential theories constitute an attempt to explain this kind of evidence. These proposals treat complex demonstratives on the model of pronouns, usually in connection with theories of indexicality and context-dependence in general. Views of this kind are often assumed as standard with little to no discussion (see e.g. Schiffer 1981, Recanati 1993, Prosser 2012 and Perry 2017), and they are a natural extension of Kaplan's influential proposal. Let us briefly review the central theses of Kaplan's system.

2.1.1 Kaplan and the "dthat" operator

Kaplan's Logic of Demonstratives (LD) (1977) was intended as a model of the functioning of natural language indexicals, and particularly of their intensional properties. He famously distinguished two different sorts of meaning, namely *character* and *content*; the latter is, simply, the customary truth-conditional contribution of an expression to the proposition expressed, whereas the former is a function from contexts to contents, i.e., a rule for determining the content that each expression receives depending of the context in which it is being interpreted. The most distinctive feature of indexicals is that their character is given by a non-constant function: they are the only expressions whose content (intension) varies from context to context.

Let us state these notions formally. Contents may be thought of either as intensions or as structured entities, and indeed I shall set aside the differences between these two notions use them interchangeably, simply as synonymous with "content". Intensions, in Kaplan's system, are functions from *circumstances* to extensions, where each circumstance is as above. Character, in turn, ranges over contexts and returns contents, where each context *c* is a tuple $<a_c, l_c, w_c, t_c>$ consisting of an agent, a location, a possible world and a time. These parameters determine, respectively, the content of the indexicals "I", "here", "actually" and "now". Thus, extensions are threefold relativized: they depend on a context *c*, a possible world *w* and a time *t*. In addition, and as usual in model-theoretic settings, they are also relative to a structure *M* and an assignment function *g*; the former can be deemed irrelevant, since natural-language semantics always works with a fixed structure, but the latter is important for modeling the behavior of variables. Assignments, just like contexts, are parameters that generate content (namely, the content of variables), so let me follow the later Kaplan (1989: 591) and treat them as just another parameter of context.[2] Thus, let each context *c* contain, in addition to the above-mentioned parameters, an assignment function g_c.

[2] The idea is not uncontroversial. Michael Glanzberg and Jeffrey King (2020: 22-24) have extensively argued against the idea that contexts should determine assignment functions – at least if we understand these functions as the object that is shifted by quantifiers.

An obvious terminological decision is to employ $[\![p]\!]^{c, i}$ for representing the extension of the expression *p* at context *c* and circumstance *i*. Abstracting over the relevant parameters yields the other two layers of meaning: $\lambda i.\ [\![p]\!]^{c, i}$ is the content that *p* receives at *c*, and $\lambda c.\ \lambda i.\ [\![p]\!]^{c, i}$ is simply its character. Just to shorten the notation, let me use "$[\![p]\!]$" for the character of *p* and "$[\![p]\!]^c$" for the content of *p* at *c*. Let us adapt FA and IFA above consequently:

> FUNCTIONAL APPLICATION (FA): If α is a branching node and {β, γ} the set of its daughters, then, for any context *c* and any circumstance *i*: α is in the domain of $[\![\ ]\!]^{c, i}$ if both β and γ are and $[\![\beta]\!]^{c, i}$ is a function whose domain contains $[\![\gamma]\!]^{c, i}$. In that case, $[\![\alpha]\!]^{c, i} = [\![\beta]\!]^{c, i}([\![\gamma]\!]^{c, i})$.
>
> INTENSIONAL FUNCTIONAL APPLICATION (IFA): If α is a branching node and {β, γ} the set of its daughters, then, for any context *c* and any circumstance *i*: if $[\![\beta]\!]^{c, i}$ is a function whose domain contains $\lambda i.\ [\![\gamma]\!]^{c, i}$, then $[\![\alpha]\!]^{c, i} = [\![\beta]\!]^{c, i}(\lambda i.\ [\![\gamma]\!]^{c, i})$

Indexicals, on this model, are directly referential expressions, i.e., their contribution to the proposition expressed (to content) is just an object. Here are some sample lexical entries:

$[\![I]\!] = \lambda c.\ \lambda i.\ a_c$

$[\![here]\!] = \lambda c.\ \lambda i.\ l_c$

Modal and temporal operators are intensional, i.e., they are functions of content, which entails that they cannot affect the content of indexicals once it has been fixed. This yields the right results when it comes to modeling the behavior of indexicals in intensional contexts; e.g., it straightforwardly accounts for the contrast between (8a) and (8b). On one of its readings, (8a) says that there is a possible world *w* such that the speaker of *w* is not speaking in *w*, which is contradictory; the reason why (8b) does not have such reading is that we do not need to look for speakers across possible worlds: all we need to do in order to assess its truth in a context *c* is to see whether there is some world *w* such that a certain object, a_c, is not speaking in *w*. In structured terms, we could say that (8a) and (8b) express, respectively, contents like those in (8c) and (8d):

(8c) <Possibly, <the speaker, not speaking>>

(8d) <Possibly, <a_c, not speaking>>

This means that, as far as content is concerned, indexicals are not different from proper names. Similarly, "here" just picks out an object and remains opaque to modal quantification:

(18) Anywhere you go, I will remain here

Things are similar, although not entirely analogous, with "actually" and "now". Intuitively speaking, they also work as directly referential terms: they pick out a certain object, and once this value is fixed they are insensitive to the circumstance in which they are being assessed. Consider, e.g., the following examples (Prior 1968; Crossley & Humberstone 1977):

(19) It is possible for everything that is actually red to be shiny

(20) Someday everyone now alive will be dead

What (19) is stating is not that there is a possible world *w* such that, for every *x*, if *x* is red in *w*, then *x* is shiny in *w*; the redness of the objects in *w* is irrelevant, for the only thing that matters is whether they are red in the *actual world*. Neither is it stating that for every actually red object *x* there is a possible world *w* such that *x* is shiny in *w*: rather, we want all the actually red things to be shiny together in a single world. Similar remarks hold for (20). This is to say that "actually" and "now" should always be able to, so to put it, "refer back" to the initial world and time, regardless of the parameters at which we are assessing the sentence (see section 3.3.1.2 for a more detailed discussion), and this is so achieved by treating them as intensional operators. For example, "actually" shifts the world of evaluation to a designated world, namely that of the context, and so does "now" for times – thus, they are on a par with "possibly", "necessarily" and "someday":

$[\![\text{actually}]\!] = \lambda c.\ \lambda i.\ \lambda p.\ p(\langle w_c, t_i \rangle) = 1$

$[\![\text{now}]\!] = \lambda c.\ \lambda i.\ \lambda p.\ p(\langle w_i, t_c \rangle) = 1$

(Here, *p* is a variable for propositions.) These lexical entries account neatly for the above sentences:

$[\![\text{It is possible for everything that is actually red to be shiny}]\!]^{c,\,i} = 1$ iff there is a world *w* accessible from w_i such that, for all *x* such that *x* is red in w_c, *x* is shiny in *w*.

⟦Someday everyone now alive will be dead⟧$^{c, i}$ = 1 iff there is a day *t* occurring after t_i such that, for all *x* such that *x* is alive in t_c, *x* is dead in *t*.

Thus, Kaplan's semantics yields the right result regarding one of its main tenets: the inability of indexicals to be affected by intensional operators. Once their content has been established, it is fixed once and for all.

However, the thesis of the impossibility of indexical shift is not yet established, for it requires a further assumption. Recall that the content of an indexical depends on context; this means that any operators shifting this parameter may still result in an indexical failing to pick out any individual. Let us devise such an operator. Let C be the class of contexts, let I be the class of circumstances, let P: I→{1, 0} be the class of propositions, and let H: C→P be the class of sentential characters. In that case, we may define the following operator:

⟦In some contexts⟧ = λc ∈ C. λi ∈ I. λh ∈ H. ∃k ∈ C (h(k)(i)=1)

On this unconventional reading, "in some contexts" is, of course, a context-shifter: "In some contexts *p*" yields truth in a context *c* and a circumstance *i* iff there is some context *k* such that "*p*" is true in *k* and *i*. Just to make it clear, let us see what happens when we embed a sentence like (21a) under the scope of the monster we just devised, as in (21b):

(21a) I am tired

(21b) In some contexts I am tired

When assessed in a context *c*, (21a) expresses a content having to do with a_c, namely the proposition that a_c is tired. However, a_c has no role to play in determining what is said by the unconventional reading of (21b); in other words, the indexical in this sentence fails to pick out an individual. This can be seen more clearly if we represent the contents of these two sentences in structured terms, as in (21c) and (21d), respectively (cf. Rabern & Ball 2019: 402-403):

(21c) <a_c, being tired>

(21d) <<the agent, being tired>, being true in some contexts>

This means that the contribution of "I" to what is said by (21b), as opposed to (21a), is not an object, and this is in tension with the idea that indexicals are directly referential. In

order to prevent this from happening, Kaplan took advantage of the fact that (21a) does not have this unconventional reading and established a thesis that is sometimes read as a prohibition: namely, that English (and presumably any other language) does not contain any expression able to shift the context parameter. Since context is the argument of character, shifting this parameter amounts to operating on character; this means that operators of this kind, if they existed, would be hyperintensional. These were dubbed "monsters" by Kaplan, since they were speculated not to exist in natural language, despite their conceivability.

In practice, this prohibition amounts to saying that every operation in natural language can be defined as a function of content. Notice, e.g., that (21b) is not yet interpretable with the rules FA and IFA above. We still require a further principle:

> HYPERINTENSIONAL FUNCTIONAL APPLICATION (HFA): If α is a branching node and {β, γ} the set of its daughters, then, for any context *c* and circumstance *i*: if $[\![\beta]\!]^{c,\,i}$ is a function whose domain contains λc. λi. $[\![\gamma]\!]^{c,\,i}$, then $[\![\alpha]\!]^{c,\,i} = [\![\beta]\!]^{c,\,i}(\lambda c.\ \lambda i.\ [\![\gamma]\!]^{c,\,i})$

So Kaplan's thesis is that HFA is not necessary. Monsters operate on character, which is a semantic value that generates content, i.e., there is no way back from the latter to the former. If monsters are allowed, there will be meaning operations that may fail to be definable in terms of content, in which case we need to apply HFA. Kaplan's ban on monsters has consequences regarding central notions of semantics such as compositionality,[3] and, even though it has been hotly contested on empirical grounds (e.g. by Schlenker 2003 and Anand & Nevins 2004), it is not an entirely empirical matter: it will always depend on which system you employ, i.e., on whether you choose to place a shiftable parameter within the context or within the circumstance. This discussion will be reprised in section 3.3.2.1.

[3] See Westerståhl (2012), Rabern (2013) and McCullagh (2018). Compositionality is normally understood as the idea that the meaning of a complex expression must be a function of the meaning of its subexpressions (Carnap 1947; Pagin & Westerståhl 2010a); when there are several layers of meaning involved, compositionality may be asked for each of them – e.g., one may wonder whether on Frege's system the sense of a sentence is a function of the sense of its component subexpressions. The above-mentioned authors show precisely that: prohibiting monsters entails that every operation can be defined as a function of content, i.e., that Kaplan's semantics is compositional at this level of meaning. Monsters are incompatible with compositionality of content, but they are nevertheless character-compositional (see Westerståhl (2012) and Briciu (2018) for proofs). See Gimeno-Simó (manuscript) for discussion on this incompatibility.

Thus, Kaplan's prohibition somehow downplays the relevance of character. Content is equivalent to what is said – the object of assertion and thought – and it is also the level of meaning at which compositional operations apply. Once this is acknowledged, character becomes rather ancillary, as defining semantic operations in terms of it turns out to be idle, redundant. Insofar as it does not play any role in the compositional semantics proper, characters could be even regarded as something alien to meaning, as if they were nothing but mere rules of use.[4] There is, however, an important notion that is defined in terms of character: logical consequence. In LD, validity is understood as *truth in virtue of character*, meaning that a sentence is valid iff it is *true in all contexts*. In turn, Kaplan defines truth in a context as follows:[5] a sentence *p* is true in a context *c* iff it is true at *c* and i_c, where i_c is the circumstance $<w_c, i_c>$ – i.e., the circumstance privileged by *c*. Logical consequence is defined analogously: *p* is a consequence of *q* iff the former is true in all contexts in which the latter is. Validity and logical consequence are interesting for natural-language semantics insofar as they are often seen as formal counterparts to the semi-technical notions of *analyticity* and *inference*. For example, in LD "It is raining" and "It is raining now" are consequence one of each other, and sentences like "I exist" or "I am here now" are valid[6] even though they are not necessary truths (i.e., "I necessarily exist" is not valid).

So far this was the basics of Kaplan's framework. Let us see now how it can be adapted for dealing with complex demonstratives. Although LD does not say anything about these expressions, it does contain an artificial operator that bears many similarities with them: "dthat". It is unclear whether it was originally intended as a formal counterpart of complex demonstratives or rather as a purely artificial device designed for philosophical purposes, but at any rate Kaplan intended it to be *directly referential*. His idea was to provide an expression that combines with a singular term and turns it into a device of direct reference, meaning that its sole contribution is an object. For example, definite descriptions are often thought of as

[4] See García-Carpintero (2000: 111-112) for some discussion.

[5] One of the basic tenets of modern relativist frameworks is precisely the rejection of this notion of validity in favor of another one in which the truth of a sentence cannot be determined just by assessing it in a context. See McFarlane (2003), Predelli & Stojanovic (2008), Predelli (2011) and Gimeno-Simó (2019).

[6] The validity of the "I am here now" and "I exist" depends on a further restriction that Kaplan imposes on contexts: in every structure ***M*** for LD, every context *c* in ***M*** must be proper, i.e., a_c exists and she is located at l_c in w_c and t_c. This property of contexts has been criticized as an extra-logical requirement that therefore should have no relevance concerning questions of meaning (Predelli 1998a, 1998b, 2004, 2005a).

singular terms,[7] but they are not directly referential, i.e., they contribute a descriptive content instead of an object:

(22) The president of Spain is tall

(22a) <<The, president of Spain>, being tall>

"Dthat" was devised in order to turn these singular terms into directly referential expressions. The idea is that, when attached to a definite description, the combined expression will contribute just an object to the proposition expressed, namely the object satisfying the description:

(22b) Dthat (the president of Spain) is tall

(22c) <Pedro Sánchez, being tall>

Needless to say, (22a) and (22c) are not true in the same circumstances. The latter expresses a singular proposition about Sánchez, and its truth does not depend on the result of any presidential election. The former, on the contrary, does depend on contingent features about Spanish politics, but need not take Sánchez into consideration – e.g., it was false in 1996, when José María Aznar was appointed. The idea is, then, that the descriptive content attached to "dthat" should work pretty much like a demonstration, i.e., something that helps fix the referent but plays no truth-conditional role[8] (Kaplan 1977: 521). It provides, then, a very intuitive way to deal with complex demonstratives: (22b) may just be a formal rendering of "That president of Spain is tall".

It remains to be shown how this idea can be implemented, i.e., the mechanism by means of which (22b) can come to express (22c). Kaplan's first suggestion (1977) was to treat "dthat" as a *rigidifier*, i.e., an expression that turns a definite description into a rigid designator. This is achieved by means of the following syncategorematic lexical entry:

[7] For reasons I mention elsewhere (Gimeno-Simó 2020a), I prefer to treat these expressions as quantifiers, following Russell (1905) and Neale (1990a). I will be using the quantificational model in the positive part of this dissertation, but none of the claims made here depend essentially on this treatment.

[8] There is a close analogy between this idea and the notion of "reference fixed by description" (Evans 1979). See Corazza (2002a) and Predelli (2015) for a discussion on the connection between "dthat" and these ideas.

⟦*dthat* (the F)⟧ = λc. λi. ⟦The F⟧$^{c, i_c}$, where i_c is as above, i.e., the circumstance consisting of the world and time of *c*: <w_c, t_c>.

This yields the right results when it comes to matters of rigidity. Namely, an utterance of (22b) made now in the actual world is true exactly in the same circumstances as "Pedro Sánchez is tall" – roughly, it means the same as "the current actual president of Spain is tall". This makes the circumstance *i* irrelevant for assessing its truth, i.e., the term becomes a rigid designator that happens to pick out Sánchez at every circumstance. The results are therefore anti-Fregean, as intended.

Let us see an example of the anti-Fregeanism of this proposal. Let me follow Kaplan's informal suggestions and regard bare demonstratives as just a special case of "dthat". More concretely, let us treat demonstrations in a manner akin to the description appended to the term, so that a bare occurrence of "that" is, simply, synonymous with "*dthat (the thing I am demonstrating)*". Thus, an everyday utterance of "that is red" may be rendered as (23):

(23) *dthat* (the thing I am demonstrating) is red

Of course, the descriptive meaning appended to "dthat" does not make the term circumstance-dependent. Rendering "that" in this manner has the result that it is a rigid designator, insensitive to the circumstance of evaluation. Namely, (24), or its formal rendering (24a), comes out as false:

(24) Necessarily, I am demonstrating that

(24a) □ I demonstrate *dthat* (the thing I am demonstrating)

This is so because, even though the truth of this sentence in a context *c* requires that a_c be demonstrating the referent of "dthat" in w_c, she is not required to do so in every possible world. Namely, (24) is true iff, for every *w*, a_c is demonstrating in *w* whatever she demonstrates in w_c. This is obviously false. The operator "dthat" keeps the demonstration anchored to the world of the context instead of the circumstance of evaluation.

This account, however, is still not entirely satisfactory: Fregeanism is still not entirely ruled out. The intensional setting in which these ideas are formulated, together with the fact that "dthat" is a rigid designator, obscures an important difference that Kaplan himself had highlighted just a few sections before: namely, the distinction between direct reference and

rigid designation. And "dthat" is still not a directly referential term. Structured propositions may help us see the difference; consider (25a-b):

(25a) 3 is a natural number

(25b) The *n* such that $n > 0$ and $n^2 = 9$ is a natural number

These two express exactly the same intension: the set of circumstances *i* such that 3 is a natural number in *i*. But they express different structured propositions:

(25c) <3, being a natural number>

(25d) <<The, $\lambda n.\ n > 0$ & $n^2 = 9$>, being a natural number>

Belief, knowledge, desire and the like are a matter of propositions, which means that structured contents provide a more fine-grained way to represent the objects of these attitudes: someone without much mathematical background may believe (25c) and not (25d), just like most people believe that snow is white without thereby believing that snow is white and there is no one-to-one correspondence between natural and real numbers.[9] The greater fineness of grain provided by structured propositions can be used for showing that, contrary to Kaplan's intended result, Sánchez is still not a component of the proposition expressed by (22b), i.e., that it still does not express (22c) (repeated below). Rather, its content is something like (22d):

(22c) <Pedro Sánchez, being tall>

(22d) <<the, actual current president of Spain>, being tall>

This is to say that "dthat (the president of Spain)" is a rigid designator only by accident. It does not grab Sánchez and takes him across possible worlds in order to see how things are with him there; rather, it goes to a possible world *w* and sees whether whoever has a certain property ("being the president of Spain in the world of the context") also satisfies "being tall" in *w*. In Kaplan's terminology, we may say that "the *n* such that $n > 0$ and $n^2 = 9$" and "dthat

[9] This, in turn, raises well-known problems of excessive fineness of grain. Arguably, "Laura loves Julia" should express the same proposition as "Julia is loved by Laura", but this need not be so in a structured setting. See Collins (2013, §3), King (2013, 2019) and Pickel (2018).

(the actual president of Spain)" are obstinately rigid, yet not directly referential terms. Kaplan himself expressed his own concerns in the following passage:

> "*The representation of content as a function from possible worlds does not allow us to distinguish between a directly referential expression and one that is merely obstinately rigid. Both cases are represented by the same function, a constant function. [...] Could anyone have confused them? [...] Could I have? Yes. [...] If "dthat" is an operator, and if the description, which constitutes the operand and thus syntactically completes the singular term, induces a complex element into content, then the correct way to describe "dthat" is as a rigidifier. Complete dthat-terms would be rigid, in fact* obstinately *rigid. In this case the proposition would not carry the individual itself into a possible world but rather would carry instructions to run back home and get the individual who there satisfies certain specifications*" (Kaplan 1989: 579-580)

Kaplan offered no formal amendment of this treatment, but he did make some suggestions for a directly referential treatment of "dthat" in his casual remarks. These are occasionally cryptic and not always consistent, and may lead to several diverging interpretations. Many of these options have been explored by Stefano Predelli (2019), building on Kaplan's hints; specifically, Predelli identified at least four possible treatments for "dthat" that Kaplan might have had in mind. Let us see what these are.

Kaplan's first "dthat" is simply the above-mentioned operator, which as we have already mentioned is not directly referential. On another possible treatment, which Predelli dubs "Kaplan's second "dthat"", every context provides an object serving as the semantic value for an occurrence of "dthat F", under the condition that this object is the only one satisfying the descriptive content designated by "F". Further constraints might be added here, but in principle a lexical entry like this one should suffice (Predelli 2019: section 2):

$[\![\text{dthat (the F)}]\!]$ = the function f such that, for any c, $f(c) = [\![\text{the F}]\!]^{c,\, i_c}$

Apparently, a problem with this lexical entry is that it still does not reflect syntactic structure, i.e., it contradicts a tenet that Bryan Pickel (2018) has regarded as central for modern defenders of structured propositions, and which he dubs the "*Mirroring Thesis*": the idea that the structure of the proposition expressed should be a perfect reflection of the syntactic structure of the sentence employed. This is a very strong thesis, and its motivations

are rather unclear, but many authors are willing to keep it,[10] and Kaplan himself seems to endorse it in some passages. The above lexical entry, in which "dthat" is semantically simple although syntactically complex, contradicts this thesis; arguably, that is the reason why Kaplan insists that, on the intended interpretation, "*"dthat" is a syntactically complete singular term that requires no completion by an operand*" (Kaplan 1989: 580-581).

This leads us to what Predelli dubs "Kaplan's third "dthat"". Here the term is syntactically simple and its role is to select an object, but this selection is mediated by another element of context, namely a linguistic one: a definite description. We may think of each context *c* as containing a definite description d_c, and then we may provide the following lexical entry (Predelli 2019: section 3):

$[\![\text{dthat}]\!]$ = the function *f* such that, for any *c*, $f(c) = [\![d_c]\!]^{c,\, i_c}$

Thus, Kaplan's insistence that the character of "dthat" is incomplete and must be filled with a description may be understood as the more familiar idea of saturation: the description is simply the argument for the character of "dthat". Notice, however, that there is a certain tension here: syntactically, the description is not a part of "dthat", and indeed it does not play any semantic role, but it still appears within syntax. At least *prima facie*, it is not clear at all whether this is a right way to vindicate the idea that the structure of a proposition should mirror the syntactic structure of the sentence used to express it. This treatment certainly makes "dthat", *qua* expression, compatible with this idea, since its contribution is just as simple as its syntax, but the sentences containing "dthat" will always turn out to be syntactically more complex than the propositions they express, since they contain a semantically inert definite description. Let us illustrate this concern by means of an example. Basically, a sentence like (26a) would express a singular proposition like the one in (26b), where *a* is some object:

(26a) dthat (the F) is G

(26b) <*a*, being G>,

[10] Cf. King (1995), Salmon (1986), Soames (1987), Keller & Keller (2013). The idea is rejected by Pickel (2018, 2019).

Here, “dthat” meets the appropriate criteria: it is syntactically simple and, additionally, its propositional contribution is as simple as it should be, basically an object *a*. However, it is also clear that (26a) is syntactically more complex than it should, for the definite description “the F” contributes nothing to (26b). A possible solution is to remove these descriptions from syntax altogether, while another one is to distinguish several syntactic levels. The latter treatment paves the way towards what Predelli calls “Kaplan’s fourth “dthat””.

The idea is that the definite description should be made to work pretty much like an apposition, i.e., something that may appear within syntax but is absent from semantics. It is thus analogous to a pointing with a finger, “*like a whispered aside or a gesture*” (Kaplan 1989b: 581). The definite description attached to “dthat” should function, so to say, as an indication of the context in which “dthat” is to be interpreted, namely a context containing a certain object or definite description instead of a different one. We may think of it as something analogous to Φ-features, in the sense that “she” may be thought of as a syntactically simple term whose feminine features play no semantic role, but do restrict the set of contexts in which the sentence is appropriately employed. In Kaplan’s own words,

> “*it is irrelevant how x gets its value, how the assignment is made […] the mechanism by which a value is assigned to a demonstrative, how a particular demonstration demonstrates its object, is extralinguistic and thus off-the-record*” (Kaplan 1989b: 571-2).

This is the idea behind Kaplan’s fourth “dthat”. The above-mentioned tension can be resolved if we distinguish two different languages: the usual language L of *logical syntax* and a new language SF of *semantic form* identical to L except that it contains no occurrences of “dthat (the P)”, where P is any property. Instead, SF contains a simple term “dthat”. Thus, the two languages only differ in that L’s version of “dthat” is syntactically incomplete and combines with definite descriptions, whereas on SF it is syntactically simple. Now we may let contexts consist of the usual parameters – agent, location, world and time – plus an additional one, s_c, which should serve as argument for SF’s “dthat”: for all *c*, the content of “dthat” at *c* is just s_c. The assignment of contents for expressions in L is dependent on the semantics for SF: for each expression *e* of L, the content of *e* in context *c* is the content that *e** receives at *c**, where *e** is the expression of SF that results from substituting any

expression of the form "dthat (the P)" in *e* for "dthat", and *c** is the context <a_c, l_c, w_c, t_c, s_{c*}>, where s_{c*} is the only *x* satisfying $[\![\text{the P}]\!]^{c,\, i_c}$.

This semantics involves operating on contexts, a kind of operation that Kaplan was not particularly fond of, but at least it vindicates a version of the main tenet of modern structured propositionalism: the semantic structure of the propositions expressed mirrors the syntactic structure of the sentences of SF employed to express them. I do not endorse the Mirroring Thesis and, indeed, I believe it may lead to severe problems, such as those noted in footnote 9; for these reasons, the semantics of complex demonstratives that I will end up adopting (section 3.2) will be formulated in a manner similar to Kaplan's second dthat.

Kaplan's views on "dthat" are ambivalent, not always crystal-clear, and at some points inconsistent. They have nevertheless inspired a whole range of views that may safely be regarded as spiritual successors of Kaplan's directly referential take on demonstratives in general. The next subsection is devoted to the most prominent of these approaches: character-theories.

2.1.2 Character theories

Character theories or *c-theories* (the label is due to Predelli 2001) provide the most natural way to deal with complex demonstratives in Kaplanian terms. Their distinctive feature is to regard the descriptive phrase attached to a complex demonstrative as a contribution to the character, rather than the content, of the expression. The three main proponents of these theories are David Braun (1994, 2008a), Emma Borg (2000) and Nathan Salmon (2002). Their accounts are not equivalent and yield slightly different predictions, but the lexical entries they provide are pretty similar. Essentially, they deal with complex demonstratives by adding a *demonstratum* parameter d_c for each context *c* and providing the following lexical entry (Braun 1994: 209, Borg 2000: 242, Salmon 2002: 523-524):

(27) For every context *c*, "that F" refers in *c* to an object α iff

i) α is the demonstratum of *c* and

ii) α satisfies F in w_c and t_c

This entry is formulated in a deliberately vague manner, for as we shall see these authors differ subtly regarding some specific details, particularly when it comes to condition (27i). For example, Braun's inclusion of a demonstratum among the parameters of context is likely a matter of simplicity, for he explicitly rejects this idea in other work (Braun 1996; his reasons are discussed in sections 3.1.1 and 3.1.2). Salmon's (2002) demonstrata, in turn, are obtained in an indirect way, for what his contexts contain is a *demonstration* that, together with the world of the context, selects an appropriate referent – his reasons not to include the demonstratum as part of the context are similar to Braun's. Borg also talks of demonstrations instead of demonstrata, although her formalism does not make it clear whether they should be part of the context. Demonstrata and demonstrations are, at any rate, arguments for character in all of these theories, and I am conceiving contexts in the same manner the later Kaplan did, i.e., as a package containing every parameter that may be relevant for character, so let me work with this lexical entry and with its simplified version of condition (27i). This is, in fact, the condition that has been subject to most of the criticisms that these theories have received (Predelli 2012a, Nowak 2019b; see section 3.1 below), but let us first see the virtues of accounting for complex demonstratives on these terms.

Since they treat complex demonstratives as directly referential terms, these theories straightforwardly account for the facts about opacity exemplified by sentences like (9)-(11) (repeated below). Namely, the descriptive meaning "F" of a phrase of the form "that F" contributes to the character of the term, with the result that operators on content are blind to it:

(9) That bald man could have had hair

(10) Tomorrow that married woman will be single

(11) Mary believes that that bald man has hair

As stated above, (9) and (10) do not display any reading in which they are contradictory, and (11) cannot be used for attributing to Mary any inconsistent belief. This is equivalent to saying that the descriptive part of the "that"-terms is opaque to the modal and temporal quantification performed by words like "could", "tomorrow" and "believe". These expressions take content as their argument, and they are therefore blind to the character of the expressions under their scope, with the result that "bald" and "married" cannot serve as

their arguments. To put it in slightly different words, the contribution of "bald man" to "that bald man" is just analogous to the contribution of "agent" to "I". Thus, the propositions expressed by (9)-(10) are as singular as they can be: that α could have had hair and that tomorrow β will be single, for some contextually salient individuals α and β. Any differences in scope are therefore irrelevant, and there is no way that these contents can come out as contradictory. Similarly, (11) attributes to Mary belief in a singular proposition, rather than a general content: she believes of a certain individual, γ, that he has hair.

On the other hand, character does have a role when it comes to matters of analyticity and inference, and character theories get things right in this case too:

(28) That spy is a spy

(29) a. All dentists are paid more than all doctors

b. Therefore, that dentist is payed more than all doctors

Sentences like (28) are analytic, and arguments like that in (29) strike us as immediately valid.[11] These facts are easily accommodated by character theories. Take (28): at any context *c* in which it is interpretable, d_c has the property of being a spy in w_c and t_c; it is therefore straightforward that d_c is a spy at any pair *c*, i_c in which (28) is interpretable – i.e., true in virtue of character. Things are similar regarding (29). Let *k* be a context making the premise true. If this is so, then it is the case that in the circumstance i_k every dentist is paid more than any doctor. In order for the whole argument to be interpretable at *k*, d_k has to be a dentist in i_k. Therefore i_k is a circumstance in which d_k is payed more than any doctor. This suffices for making the conclusion true at any context in which the argument is interpretable.

These theories also yield good results regarding sentences that are equivalent in terms of content. Consider, for instance, a context *c* such that d_c = Mata Hari. In such context, (28a) and (28b) below express exactly the same content as (28), which means that they will display

[11] Later on, Braun (2008: 70, footnotes 20-24) regretted the idea that (28) and (29) should be regarded as logical truths, although he acknowledged that any logic of demonstratives formulated in Kaplanian terms would count them as such. I personally have a strong intuition that these should be counted as analytic truths, but it is easy to adapt c-theories in order to count these sentences as non-valid: all we need is to adopt a relativist notion of logical consequence (cf. MacFarlane 2003, Predelli & Stojanovic 2008, Predelli 2012b).

the same behavior under modal operators. But the theory still counts them as non-analytic truths:

(28a) Mata Hari is a spy

(28b) That woman is a spy

This is as it should be. Similarly, "that dentist" and "Mata Hari" may have the same content in certain contexts, but substituting the conclusion of (29) for a sentence with the same content may result in an invalid argument:

(30) a. All dentists are paid more than all doctors

b. Therefore, Mata Hari is payed more than all doctors

Finally, two sentences like (28c-d) may receive the same content in a certain context, but only the latter is self-contradictory (i.e., false in all contexts):

(28c) Mata Hari is not a spy

(28d) That spy is not a spy

As Borg (2000: 238-241) has stressed, these facts about analyticity and entailment show one thing: the nominal attached to the noun phrase has a semantic role to play. The data from section 2.1.1 are compatible, and in fact very naturally fitting, with what may be regarded as an extremely Millian view, namely one in which the nominal (say, "spy" in (28) and (28d)) plays no semantic role whatsoever. This kind of theory is tentatively defended, for example, by Larson and Segal (1995), who speculate that the role of the nominal is merely pragmatic, a clue for settling who the intended referent might be. This would straightforwardly explain the facts about opacity illustrated by the above-mentioned data (how could the nominal be affected by, say, intensional verbs, if its contribution is non-semantic, and therefore not different from a pointing gesture?), but it cannot accommodate the data about analyticity and entailment, which are of semantic nature too. Character theories do explain both kinds of data: by relegating the semantic role of the nominal to the hyperintensional level, they are able to explain why intensional verbs are unable to affect it, but in turn they yield the right predictions about truth in virtue of meaning.

So far the main virtues of character theories. There is, however, a *prima facie* reasonable objection that could be raised to them. Recall that one of the main motivations of

a structured view of propositions, of which c-theorists like Braun and Salmon are notable proponents, is to provide a way to distinguish the meaning of logically equivalent expressions such as "2+2=4" and "it is either raining or not raining". The objection goes like this: unless further adjustments are made, character theories are unable to distinguish the meaning of, say, (31a) and (31b):

(31a) That man plays saxophone

(31b) That man who is either talking to Bush or not talking to Bush plays saxophone

The proposition expressed by (31a) and (31b) is the same at any context, i.e., they are indistinguishable in terms of content. But, importantly, they are so in terms of character too: character is usually conceived of as a function from contexts to contents and, of course, the character of "that man" is given by just the same function as the character of "that man who is either talking to Bush or not talking to Bush". Thus, character theories yield the result that the meanings of (31a-b) are indistinguishable: they do not just express the same structured proposition, but they also share a single character. If adherents of structured propositions wish to distinguish the meaning of logically equivalent sentences, it seems they have a reason for rejecting the distinctive lexical entry of character theories of complex demonstratives.

Structured propositionalists should *prima facie* feel more attracted to other theories. Take, for instance, Mark Richard's (1993) account, in which the contribution of a complex demonstrative to the proposition expressed is twofold: they contribute not just an object, but also the descriptive content designated by the NP attached to the "that"-phrase. This makes it possible to establish the required distinction. Namely, (31a) and (31b) express respectively something like (32a) and (32b):

(32a) $<d_c$, <<being a man> & <playing saxophone>>>

(32b) $<d_c$, <<being a man> & <talking or not talking to Bush> & <playing saxophone>>>

Of course, such theory has important drawbacks. Richard's proposal suffers from problems related to intensionality, as on his account propositions like (32a) and (32b) serve as arguments for modal operators, with the result that (9)-(11) end up with contradictory

readings – a wrong prediction. But, in principle, his theory has the advantage that he is able to distinguish the meaning of (31a-b).

But things are not so bad for character theories, for this alleged defect can be easily solved. Indeed, Braun's theory of complex demonstratives was initially presented as a way to illustrate the need for *structured characters* (Braun 1994), an idea that Borg (2000: 242-243) also endorses. Basically, the idea is to conceive character as a structured entity rather than as a function; for example, a sentence like "I am tired" may express the following structured character:

(33) <I, being tired>

In turn, this character can be fed a context *c* and return the corresponding proposition: namely, the result of assessing each of the two components of (33) in *c*:

(34a) <I(c), being tired (c)>, which is equivalent to

(34b) <a_c, being tired>

Similarly, the characters of (32a) and (32b) can be given as two distinct structured entities, i.e., as (35a) and (35b) respectively:

(35a) <<that, being a man>, being tired>

(35b) <<that, <being a man> & <talking or not talking to Bush>>, being tired>

The fact that these two characters are different does not prevent them from expressing the same proposition at any context *c*, namely (35c):

(35c) <d_c, being tired>

This means that character theories can easily adapt themselves so as to capture all the relevant differences of meaning. They also vindicate a version of the Mirroring Thesis, for clearly the characters in (35a-b) reflect the syntactic structure of (34a-b). So far, so good.

This is not the end of the story, however. These theories have been subject to a great deal of criticism. In section 2.2 we will review the objections that they have received from defenders of quantificational theories, and in 3.1 I shall present some further challenges that have been raised to them. As we shall see, all these criticisms can be avoided if we simply drop requisite (27i) from the lexical entry of demonstratives – my own solution will rely on

a version of c-theories that dispenses of this condition. But, before proceeding, let me briefly mention another, closely related class of directly referential approaches: what Eros Corazza (2002b, 2003) calls *multiple proposition theories*.

2.1.3 Multiple proposition theories

The approaches that I am grouping under the label "multiple proposition theories", or *mp-theories* for short, share most of their theoretical assumptions with c-theories; in particular, they also model complex demonstratives as context-dependent singular terms. The main difference is the way they explain the most characteristic traits of complex demonstratives, such as opacity to modal operators or the inferential properties exemplified in (29)-(30): instead of relegating the descriptive meaning of the term to the level of character, they treat its contribution as fully propositional but occurring in a different proposition. Here is a generic way to state the lexical entry typical of mp-theories (cf. Dever 2001: 306, Corazza 2003: 269):

(36) For every context *c*, "that F is G" expresses two propositions:

i) d_c is G

ii) d_c is F

For example, an utterance of (1) in a context *k* would express both that d_k is bald and that d_k is a man with a hat. The main idea behind mp-theories is that the nominal of the demonstrative, which serves as the mode of presentation of the object, has the same role as an *apposition*. Appositive sentences like (37) below are usually taken to express two propositions, namely (37a) and (37b) (cf. Neale 1999):

(37) Aristotle, disciple of Plato, was fond of dogs

(37a) <Aristotle, being fond of dogs>

(37b) <Aristotle, being a disciple of Plato>

Dever (2001: 305-306) and Corazza (2003: 269) analogize their respective approaches to this treatment of sentences containing appositives. On their view, the two following sentences are equivalent:

(38a) That woman with the red hat is Jane's sister

(38b) That, who is a woman with a red hat, is Jane's sister

In a context having Mary as its demonstratum, both sentences would express the following two propositions:

(38c) <Mary, being Jane's sister>

(38d) <Mary, being a woman with a red hat>

This way of dealing with complex demonstratives shares many of the virtues of c-theories. Notice, for example, that the descriptive content of the demonstrative, in spite of being communicated at the propositional level, is nevertheless opaque to modal operators. For instance, an utterance of (9) in some context *c* would express the propositions in (9a-b):

(9) That bald man could have had hair

(9a) <Possibly, <d_c, having hair>>

(9b) <d_c, being bald>

This means that (9) cannot attribute contradictory properties to the demonstratum of the context. Notice, in particular, that the descriptive content of the demonstrative is entirely opaque to propositional attitude verbs; consider the propositions expressed by (11) in a context *k*, namely (11a-b)

(11) Mary believes that that bald man has hair

(11a) <believing, <Mary, <d_k, having hair>>>

(11b) <d_k, being bald>

As above, a comparison with appositives may help here. It is clear that, in the following sentence, the appositive material plays no role in characterizing Mary's beliefs, but only those of the speaker:

(39) Mary believes that Julia, a lovely person, is despicable

By treating the descriptive meaning of the demonstrative in this way, mp-theories get the facts about opacity right, just like c-theories do. There are, however, important differences

between both approaches when it comes to issues of inference and analyticity. For example, it is easy to check that mp-theories need not count (28) as an analytic truth:

(28) That spy is a spy

C-theories counted this sentence as true in every context in which it was interpretable, but, from the point of view of mp-theories, all this sentence does is to express a contingent proposition twice:

(28a) <d_c , being a spy>

(28b) <d_c , being a spy>

Of course, this result is not inevitable: (28) could still count as analytic if we attributed to (28b) a different role – arguably a presuppositional one. Things are similar, although slightly more complex, when it comes to the validity of (29), but at any rate neither Dever or Corazza would count it as valid.[12] Be it as it may, the validity of these inferences is something that not even c-theorists take for granted (see footnote 11), and therefore cannot constitute an argument, or at least not a knockdown one, against the multipropositional approach.

Mp-theories, in fact, seem to enjoy a certain advantage over c-theories insofar as they are able to vindicate what Dever (2001: 292) calls "semantic innocence": the idea that the semantic behavior of an expression should be the same regardless of the linguistic context it is inserted in. According to Dever, the reason why c-theories cannot vindicate semantic

[12] On Dever's system, the argument in (29), repeated below, is equivalent to the argument in (29'):

(29) a. All dentists are payed more than all doctors
b. Therefore, that dentist is payed more than all doctors

(29') a. All dentists are payed more than all doctors
b. Therefore,
b'. That is payed more than all doctors
b''. That is a dentist

This inference is clearly non-valid; I believe, however, that it is compatible with Dever's tenets to acknowledge the possibility that (29b'') does not fall under the scope of "therefore" but, rather, constitutes an extra premise for the whole argument (i.e., that (29b'') is something communicated by any fragment of discourse containing "that dentist", and this includes the argument in (29)).

On Corazza's view, the truth of (29b) does not depend on the truth of (29b''); the latter is part of the connotation of the term, but nevertheless plays no inferential role (Corazza 2002b, 2003; cf. the theory of description names in Corazza 2002a). This means that (29) is logically equivalent to (29*)

(29*) a. All dentists are payed more than all doctors
b*. Therefore, that is payed more than all doctors

Of course, this is not valid either.

innocence is that, on their view, the contribution the nominal of a complex demonstrative makes to the proposition expressed is not its customary content; for example, "man" contributes its content to the proposition expressed by (40), but it contributes something different altogether to (1):

(1) That man with the hat is bald

(40) A man with a hat came home

Since c-theories treat the contribution of "man" as something that varies depending on whether or not the word is part of the nominal of a demonstrative, they fail to vindicate semantic innocence. Of course, the contribution that "man" makes in mp-theories is the same regardless of the linguistic environment it is found in. I shall briefly address this critique in section 3.3.2.

Not all multipropositional approaches fit the schema presented in (36). A very similar theory, from a different framework, is developed by Manuel García-Carpintero (2006), although he does not use the label "direct reference" for his own approach, but rather one that might *prima facie* seem to be at odds with the notion of direct reference: "Neo-Fregean".[13] The *rationale* behind this label is that, on his proposal, the meaning of a complex demonstrative like "that spy" features two items: its official content in a context (an object) and an additional sense-like element, namely a *reference-fixing token-reflexive presupposition* like the following:

(41) This token of "that spy" refers to whatever spy is most salient when it is uttered

Thus, the proposal differs from the mp-theories so far discussed in two important respects. In the first place, the descriptive proposition associated with the demonstrative differs from the one determined by clause (36ii) in that it is not asserted, but *presupposed*, in the pragmatic sense of presupposition advocated by Stalnaker (1972, 1973, 1974, 1978; see also Glanzberg & Siegel (2006) for a thorough study of this notion applied to the particular case of complex demonstratives). Additionally, this presupposition plays a metalinguistic role: it does not merely describe the object as being this or that way, it also determines who

[13] See García-Carpintero (2018) for the compatibility of Fregeanism and Millian approaches.

the referent of the term is. It is therefore something more akin to a Fregean sense, i.e., an aspect of the meaning of the expression that serves for uniquely presenting the referent.

García-Carpintero's framework is not meant to work only for complex demonstratives: it is part of a broader semantic theory that covers indexicals in general (García-Carpintero 1998) along with many other expressions, including proper names (García-Carpintero 2000, 2018). It is, in fact, part of a relatively common view of indexicals as token-reflexive expressions, as in the theories developed by María de Ponte, Kepa Korta or John Perry (cf. Perry 1998, 2017; Korta & Perry 2011; Korta & de Ponte 2015; de Ponte et al 2020). These theories can be seen as another kind of multi-propositional approach to indexicals in general, for they claim that sentences containing indexicals can convey both their official content and their utterance-bound "reflexive truth-conditions"; in fact, Corazza (2003: 268) analogizes his own account to Perry's.

In the Stalnakerian framework endorsed by García-Carpintero, a sentence like (28), or at least its variant "that spy is a spy, if it exists", can have a necessary diagonal proposition. Given that any utterance of this sentence is associated with the token-reflexive content in (41), every world compatible with the propositions that both speakers take for granted in uttering (28) will be a world in which the referent of that particular token of "that spy" refers to a spy. Therefore the official content expressed by (28) in a world *w* will always be true when assessed in *w* – in other words, the diagonal proposition associated with this sentence will be a necessary one.[14] Although García-Carpintero's primary concern in his 2006 essay is not analyticity but *apriority*, these two notions are so closely related that the argument could be adapted in order to count (28) as an analytic truth.

Mp-theories share many of the virtues of c-theories. Both approaches treat complex demonstratives as context-dependent singular terms whose descriptive meaning does not contribute anything to the truth-conditions of the (official) proposition associated with the utterance, thus providing an elegant account of their behavior in intensional environments.

[14] As García-Carpintero acknowledges, this assumption needs an extra requirement: *contra* Stalnaker (2006), he argues that, when trying to determine the official content expressed by a sentence when uttered in a certain world, we should keep metalinguistic facts fixed. Otherwise we could include in the common ground worlds in which complex demonstratives are associated with a completely different reference-fixing presupposition, and therefore (28) could not have a necessary diagonal proposition.

This also allows both families of directly referential theories to present a unified account of complex demonstratives and other indexical expressions: both mp-theories and c-theories can be seen as special cases of broader accounts of indexicality. In spite of these virtues, directly referential theories have been subject to a great deal of criticism, which has led many authors to develop alternative approaches, often advocating for quantificational views of demonstratives. In the next section I analyze the counterevidence traditional accounts are *prima facie* unable to accommodate.

2.2 Quantificational theories

Quantificational accounts of complex demonstratives treat these expressions on the model of Generalized Quantifiers or "GQ" (Mostowski 1957, Lindström 1966, Montague 1974, Barwise & Cooper 1981). This is in fact a very natural step to be taken once some difficulties in the core of directly referential theories have been spotted, and it is backed by syntactic evidence. In addition, it has an important historical antecedent, namely the parallel debate between Russell and the Frege-Strawson tradition concerning definite descriptions (see Gimeno-Simó 2020a for an overview). Let us briefly remind the reader about the core tenets of GQ theory.

Quantification is one of the central topics of natural-language semantics. Its main concern is the proper way to model the meaning of determiners such as "every", "a", "none", "most", "few" or "some", although quantification is in fact involved in the meaning of nearly every other expression. Interest on the topic can be traced back to the early days of semantic theory, when Gottlob Frege (1879/1931, 1891/1981a) investigated the logical properties of sentences which superficially displayed a subject-predicate form in spite of having a radically different form from a logical point of view. E.g., the inferential properties displayed by quantified sentences like (43) are very different from those of sentences involving singular terms, like (42) (further examples may be found in Heim & Kratzer 1998: §6; and Pietroski 2008):

(42) Lingens is married and Lingens is single

(43) Some people are married and some people are single

Assuming "single" to be synonymous for "non-married", (42) is self-contradictory, but (43) is not, despite sharing the same grammatical form. Similarly, the inference in (44) is valid, whereas the one in (45) is not:

(44) Laura came yesterday morning

Therefore, Laura came yesterday

(45) Nobody came yesterday morning

Therefore, nobody came yesterday

All these properties led to the conclusion that quantifiers, despite sharing many syntactic properties with singular terms, deserved a different treatment. Later on, Russell (1905) famously included phrases containing the determiner "the" among the class of quantified expressions, which he called "denoting phrases".

It is clear, however, that the quantifiers "∃" and "∀" from first-order logic are insufficient for modeling the meaning of natural language determiners. These two might be regarded as the formal counterpart of "some" and "all", and it is also possible to translate sentences containing "the" into formulae containing only Tarskian quantifiers, but natural language is host to many other determiners whose translation into first-order language is just too complex to expect any sort of systematicity. Take, for instance, "most":

(46) Most Europeans like football

If we attempt to translate (46) into a suitable first-order logic counterpart, we are at a loss. Let us devise a quantifier MOST such that MOSTx (Px) is true if the majority of the elements in the domain have the property P. It is clear that neither of the two most plausible candidates for translating (46) captures its truth-conditions:

(46a) MOSTx (Ex & Fx)

(46b) MOSTx (Ex → Fx)

Clearly, (46a) does not capture the intended meaning: what (46) states is not that most elements of the domain have both the property of being European and liking football. (46b) is not appropriate either, for (46) does not mean that it is true of most elements of the domain

that, if they are European, they like football.[15] It seems, then, that quantification in natural language should be dealt with by different means.

Cases like this one led to the rejection of the Tarskian quantifiers and the subsequent development of GC theory. On this framework, quantifiers are understood as higher-order properties that combine with two predicates in order to return truth-values. Let us devise some sample lexical entries for some well-known and already mentioned determiners:

(47) $[\![\text{All}]\!] = \lambda c.\ \lambda i.\ \lambda P.\ \lambda Q.\ \forall x\ (Qx \text{ in } i \rightarrow Px \text{ in } i)$

(48) $[\![\text{Some}]\!] = \lambda c.\ \lambda i.\ \lambda P.\ \lambda Q.\ \exists x\ (Qx \text{ in } i\ \&\ Px \text{ in } i)$

(49) $[\![\text{The}]\!] = \lambda c.\ \lambda i.\ \lambda P.\ \lambda Q.\ \exists x\ (Qx \text{ in } i\ \&\ \forall y\ (Qy \text{ in } i \rightarrow x=y)\ \&\ Px \text{ in } i)$

As these entries show, determiners combine with two predicates rather than with an open formula. This grants them the flexibility required for dealing with determiners like "most"; let us see how. Using "|P|" for representing the cardinality of any set P, and employing a loose although convenient terminology which equates sets with their characteristic functions, "most" can be modeled as follows:

(50) $[\![\text{Most}]\!] = \lambda c.\ \lambda i.\ \lambda P.\ \lambda Q.\ |P^i \cap Q^i| \geq |P^i - Q^i|$

(Where "P^i" designates the set of objects that have property P in circumstance *i*).

So far this was the basics of GC. But, before we continue, it is worth saying a word about the *semantic type* of quantifiers. Disregarding intensionality, the standard theory (Heim & Kratzer 1998) acknowledges the existence of two basic types: type *e* for individuals and type *t* for truth-values. E.g., proper names and indexicals have semantic type *e*, whereas sentences have type *t*. In addition to these basic types, there are infinitely many derivative ones. For instance, predicates have type <*e*, *t*>: they are functions ranging over objects and returning truth-values (e.g., "sing" is a predicate that takes Mary, Jack or John as arguments and returns truth if they are singing and falsity otherwise). More generally, if σ and τ are

[15] In order to see more clearly why (46b) does not capture the meaning of (46), consider a domain consisting of a European who does not like football and two Asians who do like it. (46b) is true in this domain, but, assuming for the argument's sake that *being European* and *being Asian* are mutually exclusive properties, it should not be.

semantic types then <σ, τ> is a semantic type too, where <σ, τ> is the set of functions from objects of type σ to objects of type τ.[16]

On this model, quantifiers are higher-order predicates, i.e., they take properties as arguments and return truth-values. Thus, the meaning of "all men" is given by a function that combines with properties like *being mortal* or *being bald* and yields truth or falsity. This makes <<*e*, *t*>, *t*> its semantic type. Consequently, determiners like "all" combine with two properties, which means that they are of a rather complicated type: <<*e*, *t*>, <<*e*, *t*>, *t*>>>.

These types are interesting because they allow us to rephrase the debate in more precise terms. A *prima facie* plausible way to frame the dispute is in terms of semantic types: direct reference theories treat complex demonstratives as expressions of type *e*, whereas quantificational approaches model them as having type <<*e*, *t*>, *t*>. Thus, adherents of the former theories hold that complex demonstratives are like proper names or indexicals, whereas the rival view treats them as similar to "a man", "most children" or "no woman". Analogous remarks hold for the parallel debate about definite descriptions: Russellians model these expressions as quantifiers of type <<*e*, *t*>, *t*>, whereas Fregeans treat them as singular terms of type *e*.[17] In fact, Kaplan's first "dthat", essentially a rigidified definite description, could be regarded as an example of a quantificational approach to complex

[16] As Pietroski (2018) has noted, a principle like this one results in a massive overgeneration of semantic types for natural-language expressions. The vast majority of these types are not present in any language, and they are not plausibly expected to appear. Although I basically agree with Pietroski's concerns, I will be using the standard terminology throughout this dissertation. I believe that most of what I say here can be adapted to a more psychologically plausible theory.

[17] Just for the sake of illustration, let us see a paradigmatic example of the type of lexical entry favored by each of the two theories. A typically Fregean lexical entry may be found in Heim & Kratzer (1998: 85):

> $\lambda P_{<<e, t>, e>}$: $\exists x$ (Px & $\forall y$ (Py$\rightarrow$x=y). ιx (Px = 1)

And a typically Russellian entry may be found in Neale (1990a: 45), who adapts the original one by Whitehead and Russell (1927, def. *14.01) to the framework of GQ theory:

> "The F is G" is true iff |**F** – **G**| = 0 & |**F**| = 1 (where "**F**" and "**G**" are, respectively, the set of objects satisfying the predicates "F" and "G"

The latter lexical entry is syncategorematic, but it is very easy to formulate it lambda notation, which will simplify the comparison:

> $\lambda P_{<<e, t>, e>}$. $\lambda Q_{<<e, t>, e>}$. $\exists x$ (Px & $\forall y$ (Py$\rightarrow$x=y) & Qx)

These lexical entries are very clear about the main tenets of the two theories: Fregeans treat definite descriptions as singular terms that presuppose the existence of an object satisfying the description, whereas the role that Russellians attribute to this descriptive content is that of restricting the domain of quantification, just as in any other quantifier. See Gimeno-Simó (2020a) for a thorough comparison.

demonstratives, in case we adopted a Russellian view of definite descriptions.[18] The idea that complex demonstratives are nothing but actualized Russellian definite descriptions was, indeed, entertained by Stephen Neale (1993: 107-109).

Let us illustrate the debate by means of an example. Consider (1), repeated below:

(1) That man with the hat is bald

According to the directly referential theorist, "being bald" denotes a function ranging over objects, and "that man with the hat" denotes an individual. (1) is true if that function assigns truth to the individual in question and false otherwise. Quantificational theories argue that the roles are reversed: "that man with the hat" denotes a higher-order function that is to be saturated by another function, namely the one denoted by "being bald". These two kinds of theories yield slightly different prediction which may be used for checking which of them is on the right track.

Do they? There is an important objection that can be made to this idea: namely, that all singular terms can be given the type of quantifiers. E.g., we could devise lexical entries of type $\langle\langle e, t\rangle, t\rangle$ for "Mary" or for "I":

$[\![\text{Mary}]\!] = \lambda c.\ \lambda i.\ \lambda P.\ P(\text{Mary}) = 1$

$[\![\text{I}]\!] = \lambda c.\ \lambda i.\ \lambda P.\ P(a_c) = 1$

Thus, singular terms can be modeled as if they were quantifiers. One could, in fact, suppose that this is the right way to treat them, rather than just an option – as stated in the first chapter, this was the postulate endorsed by Montague (1974). There are two reasons for supposing that $\langle\langle e, t\rangle, t\rangle$ is a more appropriate type for these expressions. On the one hand, this way of modeling singular terms allows us to unify all noun phrases under a single semantic type. On the other, giving singular terms the type of quantifiers is sometimes inescapable, for they might appear in constructions like the following:

(51) Mary and all her friends came to the party

In order to interpret a sentence like (51) we must give both components of the NP, "Mary" and "all her friends", the same semantic type. It is however not feasible to treat "all

[18] Kaplan embraces a Fregean approach to definite descriptions in his formal system (Kaplan 1977: 545), although the adoption of this view or the Russellian one is largely irrelevant for his purposes.

her friends" as a term of type *e* (what object could serve as the semantic value of such expression?), so the only option left is to employ the above lexical entry in which Mary is given the type of a quantifier:

(51a) $\lambda P.\ P(\text{Mary}) = 1\ \&\ \forall x\ (\lambda y.\ y \text{ is a friend of Mary} \rightarrow Py = 1)\ (\lambda z.\ z \text{ came to the party})$

Since it is necessary that singular terms be sometimes given the type of quantifiers, a natural step is to generalize to the worst case and suppose, as Montague did, that this is always their type. And, at least *prima facie*, the availability of this option downplays the relevance of the debate between quantificational and referential theories: if singular terms are just quantifiers of a special kind, it seems that adherents of quantificational theories have already won the match.

But this is not the end of the story. As Barbara Partee (Partee 1987, Partee & Rooth 1983) has stressed, it is in fact more empirically adequate to assume that expressions have a default semantic type but might undergo type-shifting under certain, well-defined circumstances. This is indeed the standard assumption: the usual denotation of proper names is of type *e*, but they undergo type-shifting in constructions like (51). On the other hand, and as I mentioned in the introduction, the fact that singular terms can be given the semantic type of quantifiers does not mean they are not singular terms anymore: it simply means that singular terms can be modeled in different ways.

Contrary to the assumption made above, the distinctive feature of quantificational theories is not that they give complex demonstratives the type $\langle\langle e, t\rangle, t\rangle$, for defenders of directly referential theories may do so too. Rather, they are characterized for giving these expressions a lexical entry which in no way resembles the two entries for "Mary" and "I" we provided above – this shall become clear in our discussion of King's account. Quantificational approaches to complex demonstratives were first suggested by Taylor (1980), Barwise and Cooper (1981), Keenan and Stavi (1986) and Neale (1993), although these proposals are rather sketchy and were made as a proper part of a more general theory of determiners and quantification. The two most developed and widely discussed

quantificational theories are those by King (1999, 2001) and Lepore and Ludwig (2000). Let us see what their main tenets are.

2.2.1 King's theory

Jeffrey King (1999, 2001, 2008a, 2008b) pioneered quantificational approaches to the semantics of complex demonstratives; his is probably the most discussed theory. In a well-known book he presents two different sets of counterevidence against directly referential approaches. In the first place, complex demonstratives do not share their syntax with pronouns but with determiner phrases, which gives us reason to believe that they belong to the same semantic category as the expressions of the latter kind. In the second place, and more relevantly, complex demonstratives have non-deictic uses that seem hard to accommodate for directly referential views of the semantics of these expressions. He goes on to develop an alternative account that suits both the syntactic and semantic counterevidence. In this section we shall see first what each of these two kinds of counterevidence consists of, and later on we will review King's positive proposal.

2.2.1.1 Syntactic counterevidence to direct reference

Although the focus of King's work is on the semantics of complex demonstratives, he also argues that syntax provides further support for treating them as quantifiers. Basically, he shows that complex demonstratives behave just like any other quantifier regarding *weak crossover effects* (WCO) and *antecedent contained deletion* (ACD). Let us see what each of these phenomena amount to.

WCO (Chomsky 1976, 1981; Jacobson 1977) is a well-studied phenomenon in natural language, and it has to do with some apparent violations of Binding Theory that quantifiers are subject to. This dissertation is addressed to philosophers, so let me briefly state the basics of Binding Theory (Chomsky 1981 and much subsequent work), not just in order to illustrate the relevant phenomena but also in order to introduce some notions that, although well-known in linguistics, most philosophers are usually not familiar with. Consider the following classical examples:

(52) *Mary$_1$ loves her$_1$

(53) *She$_1$ loves Mary$_1$

(54) ^{OK} Mary$_1$ loves herself$_1$

(55) *Herself$_1$ loves Mary$_1$

(56) ^{OK} Mary$_1$ loves her$_2$

(57) ^{OK} She$_1$ loves Mary$_2$

(58) *Mary$_1$ loves herself$_2$

(59) ^{OK}Her$_1$ mother loves Mary$_1$

(60) ^{OK} Mary$_1$ loves her$_1$ mother

Sentences (52) and (53) are ill-formed: "Mary" cannot be co-referential with "her" and "she". On the contrary, co-reference between the name and a reflexive pronoun is perfectly acceptable as it appears in (54), but it is still unacceptable in (55). Interestingly, dropping the co-indexing fixes (52)-(53): we may use them for stating that Mary loves, or is loved by, some other salient female, as in (56)-(57). (58), on the other hand, contrasts with the latter two in not allowing the pronoun to co-refer with the proper name. Finally, co-reference is also perfectly acceptable in (59)-(60), in contrast with (52)-(53).

Binding Theory constitutes an attempt to explain these and other facts. It is committed to a distinction between three kinds of expressions, namely *anaphors*, *pronouns* and *referring expressions* or *r-expressions*, which display very different binding patterns. Anaphors are expressions like "herself" or "himself", which necessarily inherit their referent[19] from another element of the sentence; pronouns, in turn, are expressions like "he" or "she", whose value may be obtained either anaphorically or exophorically; r-expressions, on the contrary, comprise a very wide category of noun phrases whose value never depends on another element of the sentence. Thus, e.g., proper names are paradigmatic cases of r-expressions, but this category also includes other noun phrases that cannot be seen as referential from a

[19] Saying that they "inherit a referent" is entirely inaccurate from a semantic point of view, for "herself" and "himself" are normally thought not to be referential expressions at all, but rather bound variables. Similarly, notions like "binding" and "referring expressions" are employed very differently in Binding Theory and in semantics. I will be using this loose terminology throughout this section, just for the ease of exposition.

semantic point of view, such as quantifiers ("a cat"). All these facts are captured by the three principles of Binding Theory (I will be employing the extremely simplified version of these principles found in Carnie's (2013: §5) handbook; for present purposes, the notion of "binding domain" may be just identified with the clause, and all the other relevant notions are explained below):

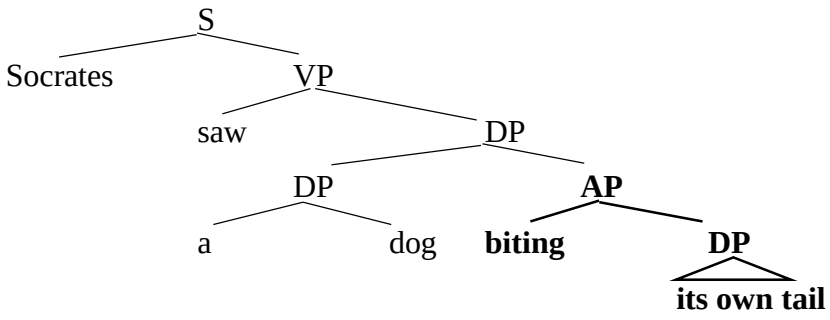
Binding Principle A: an anaphor must be (syntactically) bound in its binding domain

Binding Principle B: a pronoun must be free in its binding domain

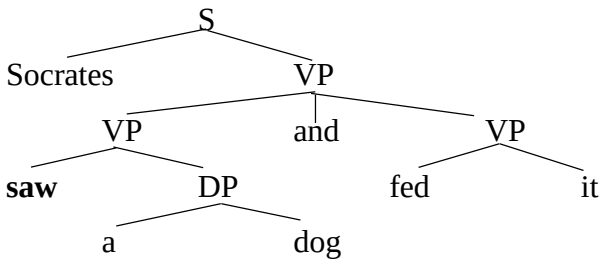
Binding Principle C: an r-expression must be free

The notion of binding employed here is related to, but different from, the semantic notion of binding; in this section I will be using "binding" for referring to the syntactic notion, but throughout the rest of the dissertation it shall refer to the semantic one unless otherwise specified. Essentially, an expression α syntactically binds another expression β iff α c-commands β and α and β are co-indexed. "Being free" is defined simply as being non-bound. Thus, the above principles may be seen as a constraint on co-indexing. C-commanding, on the other hand, is a central syntactic notion that, in short, may be summarized thus: given a sentence *s*, a constituent α of *s* c-commands another constituent β iff α does not contain β as a sub-constituent and the smallest phrase containing α also contains β. These notions shall become clearer by means of an example:

(61a)



(61b)



Neither of these trees are entirely accurate, but they will do for our purposes. Let us consider the DP "a dog" in each of these two sentences. In order to see what its area of c-command is, let us apply the definition above: it c-commands every constituent β of the sentence such that a) β does not contain "a dog" as a constituent and b) β is a constituent of the smallest phrase containing "a dog". The smallest phrase containing "a dog" in (61a) is the DP "a dog biting its own tail", which means that "a dog" c-commands every constituent of this phrase that, in turn, is not a constituent of "a dog". In other words, it c-commands the AP node and every other node under it. Thus, it c-commands "its" and it may bind it. In (61b), on the other hand, the smallest constituent containing "a dog" is "saw a dog", and this means that the pronoun "it" lies beyond its scope of c-commanding.

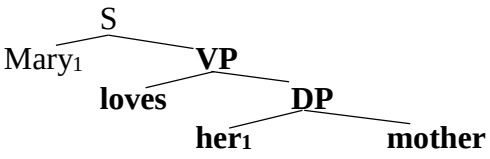
We have now an explanation at hand for accounting for the facts in (52)-(60). In (52) "Mary" c-commands "her", and they are co-indexed; this means that the former binds the latter, thus contradicting Principle B – hence its ungrammaticality. The reasoning is similar in the case of (53): "Mary" is an r-expression that should be free in virtue of Principle C,[20] but it is bound by "her". The ungrammaticality of (55), in contrast with (54), may be explained thus: in the latter "herself" is bound by "Mary", thus abiding by Principle A, whereas in the former it is the other way around, i.e., "herself" binds "Mary" and it is not bound by any other expression, which contradicts both principles A and C. A similar explanation is available for (58). On the other hand, none of the three principles is violated by (56)-(57), where proper names and pronouns are not co-indexed and therefore not bound. (59) is probably the most interesting case: here "her" and "Mary" are co-indexed (i.e., co-

[20] Copulative verbs constitute an exception to this principle: "he_1 is $John_1$" is entirely felicitous. This detail may be set aside for present purposes.

referential), yet neither of them c-commands the other. This means that both of them are free, as required by principles B and C.

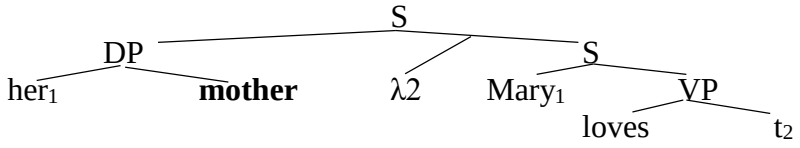
Sentence (60), however, seems to contradict this theory: “Mary” and “her” are co-indexed and, at least *prima facie*, the former c-commands the latter. If so, “her” is bound by “Mary”, which violates Principle B:

(60a)



However, this sentence seems perfectly acceptable: it is possible to employ (60) for stating that Mary loves her own mother. The solution to this puzzle lies in the classical idea that quantifiers, in the mapping from Superficial Structure (SS, known as Spell-Out since the advent of minimalism) to LF, may undergo movement. This kind of operation is known as Quantifier Raising (QR), and it consists in moving the quantifier outside the clause, leaving behind a movement trace that is interpreted as a variable and adding an extra node containing a lambda abstractor binding that variable (cf. Heim & Kratzer 1998: §7). Thus, as shown in the tree below, “her” and “Mary” do not c-command each other, and so they may be co-indexed without violating any of the Binding Principles:

(60b)



Thus, this sentence allows for a co-referential reading to the effect that Mary’s mother is such that Mary loves her. Quantifiers, in general, are subject to movement operations that proper names or pronouns are unable to perform (although some authors have questioned this idea; see e.g. Larson & Ludlow (1993)). QR is responsible for a number of phenomena, such as the scope ambiguities displayed by (3)-(8) above, and it is available for any quantifier:

(62) ^{OK} Mary$_1$ loves all her$_1$ friends

(63) ^{OK} She$_1$ loves a friend of hers$_1$

Again, the two quantifiers in these sentences are able to rise from the object position to a place where the pronoun they contain does not bind nor is bound by the r-expression or the pronoun in the subject position. Thus, none of the constraints imposed by the Binding Principles is violated. Let us see now another prediction of the theory:

(64) *His$_1$ mother loves [every man]$_1$

In this sentence, the pronoun "his" cannot co-vary with the expression in the object position, the quantifier "every man". This is in stark contrast with (59), where "her" does display co-variation with the object of the sentence. The explanation for this contrast lies in the fact that a quantifier like "every man" undergoes QR in the transition to LF: in the traditional terminology, it "crosses over" the pronoun "his" to a position where it c-commands it. This means that, if they are co-indexed, the pronoun "his" ends up bound by the quantifier, thus contradicting Principle B. This is precisely what WCO consists of. King's main point is that complex demonstratives pattern together with quantifiers in this respect:

(65) *His$_1$ mother loves [that man with a goatee]$_1$

If "that man with a goatee" worked like a pronoun or a proper name, we would expect this sentence to be well-formed, just like (59). But, according to King, it is not: "his" cannot co-refer with "that man with a goatee"; thus, (65) appears to work in analogy with (64), where the phrase in the object position is a quantifier.

Now, this evidence has been highly contested. In the first place, and as even King (2001: 176, footnote 19) acknowledges, co-reference in (65) is not entirely unacceptable, and in some contexts it may even seem natural – we shall see some examples below. Furthermore, King himself (2001: 176, footnote 20) also provides a counterexample to the idea that complex demonstratives are systematically subject to WCO effects: namely, the complex demonstrative in (66a) below admits a co-varying reading as much as the singular terms in (66b) and (66c) do:

(66a) Someone who liked her$_1$ asked [that woman wearing a red jacket]$_1$ to dance

(66b) Someone who liked her$_1$ asked Mary$_1$ to dance

(66c) Someone who liked her$_1$ asked her$_1$ to dance

King responds to his own objection by claiming that, even though the complex demonstrative in (66a) is not subject to WCO effects, no quantifier would be so in constructions of this kind:

(66d) Someone who liked her$_1$ asked [the woman wearing a red jacket]$_1$ to dance

Similarly, co-indexing with a definite description also seems acceptable, to a certain extent, in a sentence like (65):

(65a) His$_1$ mother loves [the man with a goatee]$_1$

King claims that, to the extent that (65a) does not sound any worse than (65), we have no reason to think that complex demonstratives are not quantifiers – as long as we maintain a quantificational account of definite descriptions, of course.

An important thing to be noticed is that King's claims are not crosslinguistically supported: the counterpart of (65) in other languages sounds perfectly fine under a co-referential reading. But, even focusing our attention on English, Daniel Altshuler (2006) provided several answers to this challenge. Co-referential readings of (65) can be brought to saliency by shifting the nuclear stress to other places of the sentence (as indicated by capitalization):

(67) Mary: The mother of that man with a goatee hates her only son

John: That's not true. His mother LOVES that man (with a goatee)

(68) Mary: That man's wife loves another man, right?

John: No way! His wife loves that man

The fact that these readings can be easily brought to salience suggests that they are always available, although perhaps, for some reason, not entirely salient. Additionally, Altshuler also notes that co-reference is entirely acceptable when the complex demonstrative

is understood as an epithet. For instance, in conversation (67) John could have perfectly uttered (69) as a response:

(69) His mother loves THAT LITTLE BASTARD

Furthermore, the judgements of grammaticality regarding this kind of sentences are not always consistent; in the following example, due to Johnson and Lepore (2002), the co-referential reading is the most natural one:

(70) Its collar is chocking that dog

All these arguments show that the evidence concerning WCO effects is, at least, inconclusive. Let us move on and discuss the second kind of syntactic evidence for a quantificational treatment of complex demonstratives: *antecedent contained deletion* (ACD). This phenomenon can be illustrated by means of King's own example:

(71) Tiger birdied every hole that Michael did

ACD has to do with how to resolve ellipses like the one in (71). Usually, VP ellipses are resolved by attributing to the second subject the very same property that the first one is attributed: a sentence like "Mary walks and so does John" is true iff John has the same property that Mary has, i.e., that of walking; to put it in loose terms, "did" stands for another VP. However, this procedure is unavailable in the case of (71), for attributing to Michael the very same property that is predicated of Tiger leads to a problem of infinite regress:

(71a) Tiger birdied every hole that Michael ***birdied every hole that Michael birdied…***

Of course, this is wrong. Richard May (1985) noticed this problem and set out a way to solve it, one that has to do with QR (see also Hornstein 1995). Namely, his idea is that VP ellipsis is resolved only after quantifiers have been pertinently raised. The result of raising the quantifier in (71) is given below ("t_1" is a movement trace that is to be interpreted as a variable):

(71b) [Every hole that Michael did] $\lambda 1$. Tiger birdied t_1

Now it is possible to substitute "did" for the appropriate VP: namely, "birdied t_1". The trace is to be interpreted as a variable bound by "that", which works as an object-language lambda abstractor:

(71c) [Every hole that$_1$ Michael ***birdied t_1***] λ1. Tiger birdied t_1

This predicts the right truth-conditions for (71): for every *x* such that *x* is a hole and Michael birdied *x*, Tiger has the property of birding *x*. Of course, this process presupposes that quantifiers are able to raise, for otherwise this analysis would be impossible. Now consider King's example:

(72) Tiger birdied that hole that Michael did

The ellipsis in this sentence has to be resolved in exactly the same manner as the ellipsis in (71). In order to do so, we must assume that "that hole that Michael did" is able to raise, for otherwise we would end up with the above-mentioned problem of infinite regress. The fact that this expression should raise is taken by King as proof of its quantificational nature. By contrast, he argues, ACD is impossible when singular terms are involved:

(73a) #Copp flunked Holmes, who Jubien did

(73b) #Copp flunked Holmes, who Jubien did

Altshuler (2006), however, has also called into question the idea that these facts require that complex demonstratives be quantifiers. In the first place, notice an important difference between (72) and (73a-b): in the former, the elided VP occurs in a restrictive relative clause, whereas in the latter it does so in an appositive one. King claims that the reason why he chose examples (73a-b) is that they are "the nearest examples [to (72)] involving referring expressions", but Altshuler, following Safir (1984), has argued that they are not. Namely, proper names are sometimes able to be modified by relative clauses, and these are subject to ACD; consider an utterance of (74) below in a scenario involving two men named "Edward":

(74) Are you accusing Edward who she agreed to date or Edward who she wouldn't?

Many singular terms are susceptible to this kind of modification:

(75) You who failed the exam should study more, but you who didn't should not relax

If an uncontroversial singular term like a proper name is able to undergo ACD, it seems we have good reasons for thinking that what is going on in (72), whatever it might be, is not due to the quantificational status of the demonstrative. Rather, Altshuler suggests that what ACD is actually related to is the appositional or restrictive nature of the elided material, as the example below shows:

(73c) #Copp flunked every man, who Jubien did

The fact that (73c) is ungrammatical indicates that the infelicity of (73a-b) is not due to not having employed a quantifier. Similarly, the grammaticality of (74)-(75) is indicative that quantifiers are not the only expressions that can be subject to ACD. These facts suggest that May's argument should be revised, and that it cannot be used for showing that the complex demonstrative in (72) is quantificational. If the infelicity of (73a-b) and the acceptability of (72) were due to the quantificational or singular nature of the expressions involved, we would expect (73d) to be grammatical, just like (72), but it is not:

(73d) *Copp flunked that man, who Jubien did

Thus, the data by Altshuler strongly suggest that, whatever is going on in ACD, it has to do with restrictive and appositive relative clauses, rather than with quantifiers and singular terms. In fact, the very idea that the phenomenon of ACD constitutes evidence for QR has been recently called into question by experimental data (Jacobson & Gibson 2014).

Thus, the syntactic evidence appealed to by King is dubious. But there is, in fact, yet another answer that can be raised against his arguments: namely, that syntax does not always reveal semantics. It is undoubtedly true that complex demonstratives are syntactically complex expressions consisting of a determiner and a nominal, and it is therefore no surprise that their syntactic behavior resembles that of other expressions of the same form, such as quantifiers. However, as Johnson and Lepore (2002) point out, none of this should be conclusive about their semantics. One reason for doubting that their syntax should be revelatory about their semantic properties is that complex demonstratives are syntactically realized very differently in several languages: they are determiner phrases in English, but the word "that" works as an adjective, instead of as a determiner, in ancient Latin, Attic Greek and Japanese, just to mention some examples. In spite of this diversity, complex

demonstratives display more or less the same semantic properties in all these languages; it is therefore doubtful that showing that they are determiner phrases should be conclusive about their alleged quantificational nature. Usually, the combination of determiners and nominal yields quantifiers as a result, and this is taken by King as evidence that complex demonstratives can be understood as quantifiers. But combining an adjective and a noun can result in a complex demonstrative too, and this does not show that complex demonstratives denote the sort of things that this kind of combinations usually denote, namely properties. Things are even more dramatic in languages like Spanish, where "this" and "that" can function either as an adjective or as a determiner:

(76a) Aquel hombre lleva sombrero

That man wears hat

"That man wears a hat"

(76b) El hombre aquel lleva sombrero

The man that wears hat

"That man wears a hat"

(76a-b) are semantically identical for any Spanish speaker, yet "that" plays very different syntactic roles in each of them: it is a determiner in the former and a mere adjective in the latter. I shall discuss these examples in section 2.2.2; for the moment, I believe that we can put the syntactic evidence aside for a moment and focus on the best case for King: the semantic counterevidence to a referential treatment of complex demonstratives.

2.2.1.2 Semantic counterevidence to direct reference: QI, NS, Bach-Peters, NDNS, bound variable readings, anaphora

The semantic counterevidence presented by King constitutes the most important part of his rebuttal of direct reference theories. In his 2001 book he presented four sorts of data that advocates of a directly referential approach are *prima facie* unable to accommodate, and showed that his own account is able to handle them neatly. In this section we shall see what these four kinds of counterevidence consist of, and we will review a couple of additional

types of counterexamples that King and other authors discuss in later work. These six types of counterevidence constitute the main taxonomy of counterexamples that I will be employing throughout this dissertation.

The most important class of non-deictic uses of complex demonstratives consists of what King calls "*quantification in*" uses ("QI" for short), a term most likely borrowed from Kaplan (1968). Consider the following examples:

(77) Every queen cherishes that cleric who crowned her

(78) Every skier remembers that first black diamond run they skied

QI uses occur when the complex demonstrative contains some pronoun bound by an external quantifier. Needless to say, the problem here is that the complex demonstratives in these sentences do not pick out a unique individual: (77) and (78) do not express singular propositions, but rather perfectly intelligible general thoughts. It is therefore doubtful that the semantic value of the complex demonstratives they contain can be given by an object.

Just to make it clear, let us see the predictions that standard c-theories make about QI sentences. Setting aside the details in condition (27i), the above lexical entry can be formulated thus,[21] where d_c represents the *demonstratum* of some context *c*:

(79) $[\![\text{that}]\!] = \lambda c.\ \lambda i.\ \lambda P_{<s,<e,\ t>>}\colon P(i_c)(d_c) = 1.\ d_c$

Such entry yields undeniably wrong predictions regarding QI. For example, it would make (77) above true in a context *c* iff a certain individual, d_c, is cherished by every queen, under the presupposition that d_c did all the crownings in the circumstance i_c of the context. Braun (2008a) argues that these are in fact the truth-conditions of this sentence, but he tries to explain our intuitions of non-rigidity by appealing to Gricean principles. This idea, however, seems unconvincing: our use of QI-sentences for conveying general thoughts is too

[21] This lexical entry is not entirely fair to some specific details endorsed by some c-theorists. For example, Braun (1996) and Salmon (2002) are very explicit in rejecting that demonstrata (or sequences of demonstrata) be part of the context (although Braun (1994, 2008a) does include them there, presumably for simplicity's sake). Additionally, (79) predicts that sentences containing a complex demonstrative of the form "that F" should not be interpretable in contexts in which there is no demonstratum or where the demonstratum does not satisfy "F", but this only fits Borg's (2000) and Salmon's (2002) theory, for Braun's (2008a) insists that, in these cases, the sentence is interpretable but the proposition it expresses is a gappy one. Besides, the intensional formulation of (79) does not fit the structured propositionalist framework that Salmon (1986) and Braun (1994) and argue for at length – Borg (2000) tentatively endorses this view of propositions, too.

systematic to be deemed a matter of pragmatics. No matter how much background you provide for interpreting (77) or (78), the truth-conditions predicted by standard c-theories are still highly unlikely. Mp-theories would achieve similar results, for they would predict that (77) expresses two propositions: that every queen cherishes d_c, and that d_c crowned every queen.

A second kind of alleged counterevidence comes from what King calls "*narrow scope* readings" (from now on "NS"). In these uses, the complex demonstrative contains a quantifier, and if this quantifier takes wide scope over the demonstrative, then the latter fails to pick out any individual:

(80) That professor who brought in the biggest grant in each division will be honored

(81) That senator with the most seniority on each committee is to be consulted

These two sentences have two readings. One of them is unproblematic for directly referential theories: there is a certain professor who brought in the biggest grant in all the divisions, and that particular professor will be honored – and *mutatis mutandis* for (81). There is, however, a problematic and more natural reading to the effect that, for each division *x*, that professor *y* such that *y* brought in the biggest grant in *x* will be honored. Here, the complex demonstrative takes narrow scope (hence the name of this kind of uses), with the result that no individual can serve as its semantic value:

(80a) [Each division] λ1. <u>That professor who brought in the biggest grant in t_1</u> will be honored.

(81a) [Each committee] λ1. <u>That senator with the most seniority on t_1</u> is to be consulted

It is immediately obvious that NS-readings are simply a special case of QI, the only difference being that in usual QI cases what is bound is a pronoun whereas in NS uses it is a movement trace. This is something that King himself acknowledges (2001: 173, footnote 9), and, indeed, he seems to have simply dropped the category in later essays. Let us therefore treat NS-readings as a subcategory of QI, which means that accounting for the latter straightforwardly accommodates the former.

The third kind of counterevidence comes from variants of Bach-Peters sentences (Bach 1970):

(82a) Every friend of yours who studied for it passed that exam she was dreading

(82b) That friend of yours who studied for it passed some exam she was dreading

Bach-Peters sentences are characterized by the fact that they contain two referentially co-dependent expressions: in order to interpret "it" in (82a), one must first secure the reference of "that exam she was dreading", but this demonstrative is in turn being quantified into by an external quantifier, "every friend of yours who studied for *it*", for whose correct interpretation we must first secure the reference of "it". In short: the character of the complex demonstrative depends on the character of "it" and vice versa. Things become even more dramatic for sentences containing two complex demonstratives instead of just one:

(82c) That friend of yours who studied for it passed that exam she was dreading

Anaphoric relations, then, may become problematic for theorists of direct reference. Indeed, King himself shows, in a later essay (2008b), that *anaphoric uses of complex demonstratives* also constitute an important source of counterevidence for a directly referential treatment of these expressions:

(83) [A student]$_1$ was sitting in the library. [Another student]$_2$ was sitting across from her$_1$. [That student]$_2$ had a logic book.

To see King's challenge, consider the following scenario. Imagine that "that student", in context *c*, picks out Mary. In that case the three sentences in (83) could be true together in any circumstance in which Mary has a logic book and there are two students sitting together in the library, regardless of whether Mary is or is not any of these students – she could be at home or in another country and yet (83) would be true.

It is tempting to try to explain all this counterevidence by means of some syntactic-semantic story that somehow turns a directly referential term into a non-directly referential one – say, by means of context-shifting. After all, all these cases seem to involve some sort of quantification into the complex demonstrative or some other kind of anaphoric dependence on other elements of the sentence. But the fourth kind of counterexamples that King cites in

his 2001 book (and the fifth category of counterevidence so far) relies not just on semantic issues, but also on epistemological intuitions. It consists of cases in which the speaker demonstrates nothing and intends to refer to no particular object, which is why Kings calls them "no demonstration no speaker reference readings (NDNS)". Here, the complex demonstrative does not designate rigidly the same individual across possible worlds, i.e., it does not express a singular proposition. Imagine, for instance, that a couple of days after a very difficult exam you overhear a fellow student claiming that there is someone who got the maximum score on it. Reflecting on your own about the difficulty of the exam, you utter:

(84) That student who scored one hundred on the exam is a genius

Intuitions might be fuzzy, but *prima facie* it seems that the semantic profile of the complex demonstrative in (84) is not that of a rigid designator. If you are not sure about it, try embedding it under the scope of an attitude verb:

(84a) Greg believes that that student who scored one hundred on the exam is a genius

If Greg uttered (84), (84a) would correctly describe his belief. It seems, then, that Greg does not hold a belief towards a singular proposition; rather, he believes something on purely general grounds. Notice, in fact, that there is a stark contrast between (84a) and (11) (repeated below):

(11) Mary believes that that bald man has hair

Although intuitions are far from being conclusive, the literature on the topic seems to point towards the idea that (84a), as opposed to (11), does seem to have a *de dicto* reading, i.e., one in which the complex demonstrative is not opaque to modal quantification. I shall come back to this issue in sections 3.3.1.3 and 3.3.5.2.

King presents yet another example that might be used in order to illustrate NDNS-uses. Imagine a paleontologist expressing her admiration for the hominid who first mastered the use of fire:

(85) That hominid who discovered how to start fire is a genius

Again, (85) seems to express a purely general thought. Imagine Homey was the first hominid to master fire in the actual world, and try assessing the content expressed by (85) at

a world *w* in which Homey is a genius, but the first hominid to gain control over fire was not particularly lucid and did so only by accident. (85) seems intuitively false in *w*, which means that the complex demonstrative "that hominid who discovered how to start fire" does not have the modal profile of a rigid designator. And an important thing to have in mind is that, unlike the previous cases, there appears to be no anaphora nor binding in (84) and (85).

NDNS uses of complex demonstratives also include an important sub-class: *complex demonstratives under modals* (Maclaran 1982; Roberts 2002, 2003; Nowak 2014):

> (86) Although it's clear that we need someone to dig us out of the hole we are in, I doubt Dany is that hero
>
> (87) Michelin is hoping to find ten new tire inspectors. These new employees would be required to work the night shift for three weeks
>
> (88a) Amy is looking for that boy who makes her heart beat faster, her stomach flutter and her mind wander
>
> (88b) Every girl is looking for that boy who makes her heart beat faster, her stomach flutter and her mind wander

The truth of sentences (86)-(88b) does not require the existence of any particular individual; it seems, then, that a notion like direct reference is helpless when it comes to accounting for their semantics. In general, complex demonstratives can be anchored to counterfactual situations, which produces NDNS uses. And, even though the above examples seem to involve anaphoric dependence of some sort, Nowak (2014) provides examples of this kind which at least *prima facie* do not even require anaphora:

> (89) If Gore had won the election, he would definitely have embraced that elector who cast the deciding vote

An example like (89) shows that modal anchoring can appear without requiring any sort of apparent anaphora (although, as we shall see in section 3.1.2, there *is* anaphora, albeit not exactly of the kind Nowak had in mind in his discussion).

Finally, King (2008a, 2008b) also cites cases in which complex demonstratives appear to function as bound variables – a phenomenon which, to my knowledge, was first noticed by Evans (1977a: 491). Here is an example of it:

(90) [Every student] λ1. t_1 has a professor who thinks [that student]$_1$ is smart

Notice that there is an important difference between QI uses and *bound variable uses*. In the former case, the complex demonstrative contains a bound variable, but in the latter it is the demonstrative itself that is bound. A different mechanism must be in play, then.

In sum, we have six main types of counterevidence that seem to play against c-theories: QI uses, NS readings, Bach-Peters sentences, anaphoric uses, NSDS uses (including cases of modal anchoring) and bound variable uses. NS readings are actually just a special case of QI, so in all we have five types of counterexamples. I shall discuss all of them one by one in section 3.3 in order to show that the alleged counterevidence poses no real threat to character theories. In a nutshell, my argument can be summarized in three steps: a) it is no surprise that binding and QI generate non-deictic uses; b) anaphoric uses of complex demonstratives are actually a special case of what Evans (1977a, 1977b, 1980) called "E-type anaphora", which generates non-referential uses of *any* pronoun; and c) all these types of counterevidence can be shown to be just a special case of QI, binding or anaphoric uses, or a combination of these. Thus, the threat that this counterevidence poses for c-theories is not greater than the challenge that E-type anaphora and bound uses of simple pronouns pose for direct reference. I take these analogies between pronouns and complex demonstratives as evidence that the latter should be treated in the same manner as the former.

2.2.1.3 King's three alternatives

The inability of standard referential theories to account for the counterevidence in the previous sections led King to the conclusion that quantificational accounts constitute a more promising approach to the semantics of complex demonstratives. Alternatively, defenders of direct reference could argue that complex demonstratives are actually ambiguous expressions that display both referential and attributive readings, to echo Donnellan's (1966) distinction. Ambiguity theories, however, are *per se* not very attractive, for they involve, among other disadvantages, complicating the lexicon (see the discussion in section 2.3), which is why King rejects them (King 2001, §5). Instead, he sets out to provide a unified theory able to handle both deictic and non-deictic data. Throughout his work he presented three distinct

theories; let me briefly review each of them, just in order to see what is at stake – i.e., in order to see what a quantificational theory should look like.

King's first proposal for a quantificational treatment of complex demonstratives (King 1999) modeled these expressions pretty much as if they were rigidified definite descriptions, a treatment he later on regretted (King 2001). His theory differs from Kaplan's (1977) and Neale's (1993) in important respects, and it is worth discussing it in order to see how its flaws were amended by later work – as he himself acknowledges, it was only intended as a rough sketch of what a quantificational account should look like, and not as a fully developed theory. However, before discussing King's first theory it is worth introducing a feature common to all three of his accounts: the role of speaker intentions.

King follows the later Kaplan (1989) in acknowledging a very relevant role to intentions, and in particular speaker intentions, in determining the value of demonstratives in a context; namely, they are what ultimately settles what this value is – other issues that may seem important in this respect, such as gestures, are relevant only insofar as they reveal the intentions of the speaker. But, importantly, on King's view speaker intentions do not always pick out objects. Namely, he distinguishes two kinds of intentions a speaker may have: *perceptual intentions* and *descriptive intentions*. The former are the usual, object-oriented intentions in which the speaker intends to talk about some particular individual she is acquainted with, whereas the latter, by contrast, do not require acquaintance of any sort: they are cases in which the speaker intends to speak about whoever uniquely satisfies a certain property (for the sake of illustration, I may want to say something about the first child born in the 22nd century).

Importantly, both kinds of intentions determine *properties*. This is straightforward in the case of descriptive intentions: each of them is associated to the property used for individuating some object, such as being the first child born in the 22nd century or the second referee of my next paper. Perceptual intentions, on the other hand, also determine properties: if my perceptual intention is oriented, say, towards Angela Merkel, then I may obtain the associated property, namely that of *being identical to Angela Merkel*. Let us call properties

of the latter kind *haecceitistic*,[22] to borrow Kaplan's (1976) expression. Thus, insofar as each use of a complex demonstrative is associated with an intention, it can be paired with a property, *haecceitistic* or not. Distinct occurrences of demonstratives in a sentence may be associated with different intentions, and this fact is stressed by King as one of the crucial differences between complex demonstratives and definite descriptions, namely the one that allows two distinct complex demonstratives to refer to distinct objects in spite of occurring in the same context. King (2013, 2014a, 2014b, 2020) employs the label "supplementive" for referring to expressions of this kind, which require something besides a context (e.g., an intention) in order to determine a content; for the sake of simplicity, I shall assume at most one occurrence of a demonstrative per sentence.

In all of King's three theories, complex demonstratives take as argument a contextually-determined property.[23] Just for the sake of terminological uniformity, let me treat these properties on a par with other parameters of context, i.e., let each Kaplan-style context *c* be supplied with a property R_c in addition to the usual parameters of world, time and agent (King does not include locations because they are irrelevant for the purposes at hand, and I will be omitting them too, not just in this section but during the rest of this dissertation).[24] Formally, properties are functions from circumstances to sets of individuals or, alternatively, from circumstances to functions from individuals to truth values. King's first theory, which I shall dub "K1", treats contextually determined properties on a par with the descriptive meaning of the demonstrative: if I utter "that man is tall" while my intentions

[22] This label is employed by King in a later essay (King 2008a), although he talks of *haecceitistic* intentions instead of properties. Haecceitistic intentions, of which the perceptual ones are a proper subset, are intentions able to determine what I am calling "haecceitistic properties".

[23] Strictly speaking, the argument that "that" takes in King's three systems is not a property, but rather what he calls a "propositional frame". Some of these propositional frames have the form of an open formula, and therefore they can be quantified into. This is the natural way to proceed, given King's endorsement of a structured propositionalist framework and the fact that, in his formal system, variables contribute themselves to the proposition expressed (King 2001: 164). Much like King himself, I shall stick to the use of the word "property" for simplicity's sake, and also because this is the term that authors discussing King's system usually employ.

[24] King does not formulate his theories on these terms, but the translation is rather straightforward, given his assumptions. I am not entirely sure whether he would endorse treating properties on a par with agents, locations and the like, but my rephrasing does not affect the predictions his theories make. In his formal system (King 2001: 165), King does not include these properties as part of the context; rather, he assumes that there is a function *f* mapping each context to one of these properties. This is not entirely equivalent to incorporating the properties directly into context as I am doing here, for the fact that *f* is a function means that there is a further requirement in order for the translation to be equivalent: namely, that for any two contexts *c* and *k*, if $a_c = a_k$, $t_c = t_k$ and $w_c = w_k$, then $R_c = R_k$. See also the discussion below.

are addressed towards, say, Muhammad Ali, then the properties of *being a man* and *being identical to Muhammad Ali* play exactly the same role. This is reflected in the syncategorematic semi-technical lexical entry that King provides for "that" in K1:

> (91) For any context *c*, a sentence of the form "That F is G" expresses the following proposition: F and R_c's unique instance in i_c is P

This might become clearer by discussing the above example. If I utter "that man is tall" while pointing at Muhammad Ali, we might assume that the designated property of that context is, simply, that of *being identical to Muhammad Ali*. Consequently, I will have expressed the following proposition: that the unique object satisfying in i_c the properties of *being a man* and *being identical to Muhammad Ali* also satisfies *being tall*. Of course, this resembles the semantics of definite descriptions and other quantifiers, rather than that of indexicals. The only difference is that complex demonstratives are context-dependent, but that aside they are pretty much like any other generalized quantifier. More specifically, and to put it in King's terms, a complex demonstrative has four slots, two of which have to be filled with contextually-determined parameters, but the output of this process is a generalized quantifier, i.e., a two-place relation between properties, just like the lexical entries (47)-(50) above.

Let us see this in more detail. Essentially, King's K1 hold that the context-independent meaning of "that" is given by the frame in (92a) below, whereas (92b), on the other hand, represents the propositional contribution of "that" in some random context *c*:

> (92a) __ and __'s unique instance in __ is __
>
> (92b) __ and R_c's unique instance in i_c is __

Of course, (92b) is not different from the entries for "all", "some" or "most": it requires completion by two properties in order to return a truth-value. And, just like in the case of every other quantifier, these two properties are obtained from the nominal attached to the demonstrative and from the predicate of the sentence in which it is inserted. This similarity can be further stressed if we formulate the lexical entry in more precise terms, employing the Kaplanian terminology that I will be using throughout this dissertation:

(93) ⟦that⟧ = λc. λi. λP. λQ. ∃x ($R_c(i_c, x) = 1$ & $P(i_c, x) = 1$ & ∀y (($R_c(i_c, y) = 1$ & $P(i_c, y) = 1$) → x=y) & Q(i, x) = 1)

This is a rigidified definite description as much as Kaplan's first "dthat": the contextually determined property and the property determined by the nominal attached to the complex demonstrative are both assessed in the world of the context. Its quantificational status becomes clear through the fact that it expresses a relation between two properties.

Sometimes the contextually-determined property can be *redundant* with respect to the demonstrative, i.e., the property intended by the speaker and the one attached to the complex demonstrative may be identical. These cases typically result in NDNS-uses. Consider, for example, an utterance of (84), repeated below, in the scenario that we provided for illustrating this sentence, i.e., one in which the speaker has no clue about who the student who got the maximum score might be:

(84) That student who scored one hundred on the exam is a genius

Arguably, the speaker's intention here is *descriptive*: she wants to say something about whoever happens to be the student who scored one hundred on the exam. This means that the contextually-determined property is identical to the property attached to "that", i.e., *being a student who scored one hundred on the exam*. This, according to King, accounts for the non-deictic reading that the complex demonstrative in (84) displays. Namely, (84) expresses the following proposition:

(84b) λi. The unique individual satisfying being a student who scored one hundred in i_c and being a student who scored one hundred in i_c is a genius in *i*

It is clear that (84b) accounts for the idea that (84) is not about any individual in particular. However, it also reveals what King regards as a fatal flaw of K1: namely, the strict rigidity that (93) imposes. The reasoning is analogous to the above discussion on the way Kaplan's first "dthat" dealt with (22b): if Mary happens to be the student who actually scored one hundred, (84b) will be true at any world *w* in which Mary is a genius, even if she failed that particular exam in *w*. But, King claims, this does not fit our intuitions towards (84), which should be true at any world in which there is a unique student who scored one hundred and is a genius, regardless of Mary's deeds in that world. The flaw becomes more evident if

we consider QI uses; for example, (77) expresses the following proposition in K1 (assuming that speaker intentions are also redundant):

(77a) λi. [∀x: x is a queen in *i*] (x cherishes in *i* the unique individual who is a cleric and crowned x in i_c and is a cleric and crowned x in i_c)

In order to see why (77a) does not capture the right reading of (77), try assessing the truth-conditions of this sentence at some random circumstance *i*. It yields truth iff every queen in *i* cherishes the cleric that crowned not at *i* but at i_c. This means that (77a) is too rigid. Intuitively, (77) should be true at any circumstance *i* such that every queen in *i* cherishes the cleric that crowned her in *i* – i.e., the complex demonstrative shouldn't be different from a definite description.

King's second theory, which I shall dub "K2", is devised to account fix these flaws. It only requires slightly modifying K1 by dropping the rigidity requirement. Modifying (92a-b) accordingly, we may say that "that" expresses now a three-place relation between properties with no slot for the circumstance, as in (92c). The second slot is filled with the property privileged by the context, yielding as a result a two-place relation like the one in (92d):

(92c) __ and __ unique instance is __

(92d) __ and R_c unique instance is __

In our terminology, we may state it thus:

(93a) ⟦that⟧ = λc. λi. λP. λQ. ∃x (R_c(i, x) = 1 & P(i, x) = 1 & ∀y ((R_c(i, y) = 1 & P(i, y) = 1) → x=y) & Q(i, x) = 1)

This is, essentially, a context-dependent (but non-rigid) definite description; in fact, in those cases in which the intentions of the speaker are redundant it will just be a definite description. Thus, K2 straightforwardly accommodates our intuitions towards (77) and (84). In addition, our intuitions of rigidity regarding canonical deictic uses of complex demonstratives can still be preserved in K2, for, recall, perceptual intentions usually determine the property of being identical to some object (what I called a "haecceitistic property"). Imagine an utterance of (94) below in a context *c* in which I am pointing at Angela

Merkel. Arguably, R_c is, simply, $\lambda i.\ \lambda x.\ x = Angela\ Merkel$, and therefore K2 predicts that (94) expresses the proposition in (94a):

(94) That woman with a coat looks sympathetic

(94a) λi. The unique individual *x* such that *x* is a woman in *i* and *x* is identical to Angela Merkel in *i* looks sympathetic in *i*

Of course, this is as rigid as it should be: no matter in which circumstance *i* you assess (94a), its truth will always require Merkel to look sympathetic in *i*. In general terms, complex demonstratives accompanied by a perceptual intention will always be rigid, whereas those accompanied by descriptive intentions will be equivalent to definite descriptions.

This solves the complications K1 was faced with, but, as a drawback, K2 suffers from converse problems: namely, it allows too much descriptive content to be assessed at the circumstance of evaluation. Imagine, again, that I utter (94b) while gesturing towards Merkel. K2 predicts that my utterance will have the truth-conditions in (94c):

(94b) Emmanuel believes that that woman with a coat is sympathetic

(94c) λi. in all circumstances *j* compatible with Emmanuel's beliefs, the unique object that instantiates being a woman with a coat in *j* and being identical to Merkel in *j* is sympathetic in *j*

In order to see why these truth-conditions are wrong, consider a scenario in which, while it is true that Emmanuel believes that Angela Merkel is a sympathetic person, he is not aware that she is wearing a coat today. Of course, in such scenario it is still correct to employ (94b) for reporting Emmanuel's belief, but (94c) predicts that it shouldn't, for it requires Emmanuel to believe that Merkel is wearing a coat. More dramatically, K2 predicts that a sentence like (11), repeated below, should have a contradictory reading:

(11) Mary believes that that bald man has hair

These and analogous considerations led King to reject K2 as an appropriate theory for complex demonstratives.

The theory King finally settles for may be called "K3". This theory differs from the two previous ones in requiring that intentions determine, for each context *c*, two different

things: a property R_c and a higher-order predicate J_c operating on pairs of properties and returning a singleton consisting of the only object (if any) satisfying both properties in a certain circumstance. Let us state this in King's semi-formal terms. The context-independent meaning of "that" in K3 is the following four-place relation:

(92e) __ and __ are __ in an object *x* and *x* is __

The main difference from K1 and K2 lies in the argument for the third slot, for it is to be filled with the above mentioned higher-order property J_c:

(92f) __ and R_c are J_c in an object *x* and *x* is __

But, importantly, for each context *c* there are only two possible kinds of higher-order properties for which "J_c" may stand: either "being jointly instantiated in i_c" or, simply, "being jointly instantiated". Thus, given a certain context *c*, there are only two possible context-dependent meanings that "that" may express:

(92g) __ and R_c are jointly instantiated in i_c in an object *x* and *x* is __

(92h) __ and R_c are jointly instantiated in an object *x* and *x* is __

I.e., whether the complex demonstrative is rigid or circumstance-dependent will depend on which of the two higher-order predicates is salient in the context of utterance. In Kaplanian terminology, we may state it thus: each context *c* should contain a property R_c and a higher-order predicate J_c, where J_c may be identical to either J_1 or J_2:

$J_1 = \lambda i.\ \lambda P.\ \lambda Q.\ \lambda x.\ (P(i_c, x) = 1\ \&\ Q(i_c, x) = 1\ \&\ \forall y\ ((P(i_c, y) = 1\ \&\ Q(i_c, y) = 1) \rightarrow x=y)$

$J_2 = \lambda i.\ \lambda P.\ \lambda Q.\ \lambda x.\ (P(i, x) = 1\ \&\ Q(i, x) = 1\ \&\ \forall y\ ((P(i, y) = 1\ \&\ Q(i, y) = 1) \rightarrow x=y)$

Let me call contexts containing J_1 and J_2 "J_1–type contexts" and "J_2–type contexts", respectively – of course, there is not a single J_1, since each J_1-type context will contain a different one; let me simplify things by talking of J_1 *simpliciter*. The lexical meaning of "that", in turn, is given by the following function:

(95) $[\![\text{that}]\!] = \lambda c.\ \lambda i.\ \lambda P.\ \lambda Q.\ \exists x\ (J_c(i, P, R_c, x) = 1\ \&\ Q(i, x) = 1)$

This lexical entry can yield the right predictions about most of the data in section 2.2.1.2, although, as we shall see, it can do so only under an assumption that strikes me as dubious at the very least. Let us see how it handles NDNS-uses. Arguably, these are cases in which the speaker intentions are descriptive and, additionally, the context contains J_2. For example (and assuming redundant intentions, as above), "that" would express the following content in the context we provided for (84):

(84d) __ and being a student who scored one hundred are jointly instantiated in an object *x* and *x* is __

Or, in our terminology,

(84e) λi. λP. λQ. ∃x (x is a student who scored one hundred in *i* & P(i, x) = 1 & ∀y (y is a student who scored one hundred in *i* & P(i, y) = 1) → x=y) & Q(i, x) = 1)

Filling the two property slots P and Q with the two arguments with which "that" combines in (84) yields the following proposition:

(84f) λi. ∃x (x is a student who scored one hundred in *i* & x is a student who scored one hundred in *i* & ∀y (y is a student who scored one hundred in *i* & y is a student who scored one hundred in *i*) → x=y) & x is a genius in *i*)

Thus, the user of the complex demonstrative in (84) could have employed a definite description and it wouldn't have made any truth-conditional difference. Let us see now how K3 handles canonical deictic uses. In our example involving Angela Merkel, K3 requires that the speaker have a perceptual intention and that the context's higher-order property be J_1. Here is the truth-conditional contribution of "that" in such context:

(94d) λi. λP. λQ. ∃x (x is identical to Angela Merkel in i_c & P(i_c, x) = 1 & ∀y (y is identical to Angela Merkel in i_c & P(i_c, y) = 1) → x=y) & Q(i, x) = 1)

Of course, this is rigid, but, importantly, it also makes the descriptive meaning of the demonstrative ("F" in "that F") context-dependent rather than circumstance-dependent. Here is the proposition expressed by (94) in that context:

(94e) λi. ∃x (x is identical to Angela Merkel in i_c & x is a woman with a coat in i_c & ∀y (y is identical to Angela Merkel in i_c & y is a woman with a coat in i_c) → x=y) & x looks sympathetic in *i*)

These truth-conditions are intuitively right, and in fact K3 also yields good predictions for a sentence like (94b). Namely, embedding (94e) under an attitude verb yields the result that "that woman with a coat" works pretty much as if it were a directly referential term, for it is still anchored to the context:

> (94f) λi. for all circumstances *j* compatible with what Emmanuel believes in *i*, ∃x (x is identical to Angela Merkel in i_c & x is a woman with a coat in i_c & ∀y (y is identical to Angela Merkel in i_c & y is a woman with a coat in i_c) → x=y) & x looks sympathetic in *j*)

These truth-conditions require Merkel to wear a coat in the actual circumstance, but do not require Emmanuel to believe that she is doing so. For all these reasons, King (2001) settles for K3.

Now, there are important problems with this theory, and in particular with its reliance on higher-order properties like J_1 or J_2. In the first place, the idea that these are determined by speakers' intentions seems *prima facie* objectionable: intentions are usually thought of as something agents consciously entertain, and therefore the object of an intention is something they should in principle be able to consciously access. But, arguably, average people have no conscious access to J_1 and J_2 nor to some non-formal version thereof. Of course, King could respond that this kind of properties *model* what intentions determine, rather than being actually intended by speakers. This is an idea that King has argued for in other places. Let me sketch a possible response that is consistent with the view of the role of intentions that King has defended in later essays.

In discussing the role of intentions in determining a scale for gradable adjectives, King (2014a, 2020) agrees with Michael Glanzberg (2012) that ordinary speakers are unlikely to have intentions about functions from the meaning of an adjective to a degree in a relevant scale. In his own words, "*exotic, highly abstract or mathematically sophisticated entities are ruled out as semantic values of a supplementive in the mouths of ordinary speakers*" (King 2014a: 108). Of course, this rules out that they may have intentions about J_1 or J_2 either. King responds to this challenge by arguing that it is nevertheless possible to obtain the sophisticated abstract objects in a systematic manner from the intentions of speakers: given

an ordinary intention, it is possible to determine a value that, although it is unlikely to be intended by a speaker, can nevertheless be obtained on the basis of that very intention. As he puts it, "*make sure the objects of speakers' intentions really are things they can have intentions about and that hearers can have beliefs about* [...] *Call these the objects of the intentions. Then make sure the objects of intentions determine the semantic values assigned to the supplementives in context in some manner or other*" (King 2014a: 110). Judging from these informal remarks, it is plausible that he would regard J_1 and J_2 as objects that cannot be intended by ordinary speakers but may nevertheless be systematically determined on the basis of their intentions.

King formulates this response when discussing gradable adjectives, but he intends his claims to hold for intentions in general, including of course those associated with complex demonstratives. I find this response rather convincing, so let us assume it works. Even so, notice that K3 does not, *per se*, block readings such as (84b), (77a) or (94c). Here is the reason: it is possible to find J_1–type contexts containing properties like those determined by descriptive intentions and, similarly, one can devise J_2–type contexts containing the kind of properties associated with perceptual intentions. I.e., it is possible to find contexts like the following:

$c_1 = \langle a_c, w_c, t_c, J_1$, being a student who scored one hundred on the exam$\rangle$

$c_2 = \langle a_c, w_c, t_c, J_2$, being identical to Angela Merkel$\rangle$

An utterance of (84) in c_1 would result in a reading equivalent to (84b), i.e., a reading that is truth-conditionally identical to the one directly referential theorists predict. I do not regard this as a problem for King's theory, for arguably it is not implausible to attribute such reading to this sentence, but, given King's assumptions on the matter, rigidity does prove fatal when it comes to QI-readings like (77a). On the other hand, the existence of contexts like c_2 poses an even more fundamental threat for K3: assessing (94b) in c_2 yields as a result the proposition in (94c), which as we have already seen is wrong.[25]

[25] King does discuss cases in which the descriptive meaning of complex demonstratives seems to fall under the scope of attitude verbs (King 2001: §3, particularly pp. 109-116), but the evidence he cites seems to me dubious and, at any rate, explainable by other means. I present and discuss this alleged counterevidence in sections 3.3.5.2 and 3.4.2.1.

So King needs some way of preventing the existence of contexts like c_1 and, more importantly, c_2. One possible way to do this is by incorporating into the semantics a principle like the following (for the sake of discussion, assume at most one occurrence of a complex demonstrative per sentence):

> INTENTIONAL PAIRING: for any context *c*, if a_c's intentions in *c* are perceptual then $J_c = J_1$, and if they are descriptive then $J_c = J_2$

Arguably, a principle like this one does not pertain to semantics proper, but rather to the metaphysics of contexts, understanding these not as abstract objects but rather as actual settings in which real actions – utterances – take place. King himself justifies a restriction like this one as follows:

> "Because the speaker intends to talk about *b* and is using the predicate `F' to pick out *b* in the context of utterance in such a case [when she employs a complex demonstrative accompanied by a perceptual intention], the speaker intends to express a proposition that tracks *b* across worlds and times, regardless of its possession of the property expressed by `F' at those worlds and times. This is why the speaker's intentions determine the property of being jointly instantiated in w, t in such cases. [...] But now consider a case in which a speaker uses a `that' phrase but has a descriptive intention instead of a perceptual one [...] since the speaker has no individual in mind in such a case, he does not intend to express a proposition that tracks a particular thing across worlds and times regardless of its possession of the property expressed by `F'. His intention seems to be to claim that something uniquely jointly instantiates the property expressed by `F' and a property determined by his descriptive intention (King 2001: 46-47)

I agree that this is probably the case in most occasions, but this strikes me as a *pragmatic* justification rather than a semantic one. And, to use Kaplan's catchy phrase, one should take good care to distinguish the "vagaries of use" from the "verities of meaning" (Kaplan 1989: 585; see also Predelli 2004, 2005a, 2013). This is to say that facts having to do with empirical regularities unrelated to meaning, such as, say, the fact that usually speakers are located at the same place from which they are talking, should bear no effect on one's semantic theory, which is meant to model logical properties of *language proper*, such as entailment and validity.

However, Kaplan himself incorporated into his logic restrictions that have nothing to do with meaning properly speaking. For example, one of his semantic clauses states that the agent of a context must be always located at the time, place and world of the context (Kaplan 1977: 544). This restriction turned out to be indispensable for validating some truths which he regarded as analytical, such as "I am here now" or "I exist" (see Predelli 1998a, 1998b, 2008, 2013 for criticisms); it might therefore seem that building a principle like INTENTIONAL PAIRING directly into the semantics is not entirely unreasonable. But, as we shall see now, such incorporation is not quite telling, for by doing so we would end up with some undesirable consequences. Namely, we would come dangerously close to counting sentences like (96) as valid (i.e., analytic):

(96) If this man is tired, then I have an intention

Let us see why (a similar point is discussed in section 3.1). If we wish to incorporate INTENTIONAL PAIRING into the semantics, we need to make it by means of some sort of restriction on the set of contexts that can be employed for interpreting our sentences. This is pretty much like the restriction that, as we mentioned in the previous paragraph, Kaplan implemented in his system in order to prevent sentences from occurring in certain contexts which would contradict his theses; similarly, King needs to rule out contexts like c_1 or c_2 as improper. And this is, in fact, what he does in his formal system. In his semantics, R_c and J_c are not part of the context; rather, he incorporates into his semantics a couple of functions *f* and *h* mapping each context to a property and to either J_1 or J_2, respectively (see footnote 24). King's version of INTENTIONAL PAIRING is equivalent to the following principle: for any object *b* and context *c*, if *f*(*c*) is the property of being identical to *b*, then *h*(*c*) = J_1; otherwise, *h*(*c*) = J_2 (King 2001: 165). Thus, King ensures that each context will be paired to a suitable pair of property and higher-order property. Before discussing the consequences of this principle, let me translate it into the framework we are employing here.

The natural way to translate this into our system is, simply, to incorporate R_c and J_c directly into the context and to state that, for any context *c* and object *b*, if R_c is the property of being identical to *b*, then $J_c = J_1$, and otherwise $J_c = J_2$ – so far the difference is just terminological. However, the fact that *f* and *h* are functions means that we still need a further

restriction. In our terminology, what this means is that, if there is a context like, say, c_3, then contexts like c_4 or c_5 cannot exist:

c_3 = <Carnap, @, t, being identical to Otto Neurath, J_1>

c_4 = <Carnap, @, t, being identical to Otto Neurath, J_2>

c_5 = <Carnap, @, t, being identical to Ruth Marcus, J_1>,

where "t" stands for, say, 9AM of the 2nd of April of 1947. What this amounts to is this: given an agent, a time and a world, her intentions can only determine a property and either J_1 or J_2. In more general terms, it requires adopting a principle like the following:

> INTENTION DETERMINATION: for any two contexts *c* and *k*, if $a_c = a_k$, $t_c = t_k$ and $w_c = w_k$, then $R_c = R_k$ and $J_c = J_k$

By means of these two principles it is possible to achieve the results King wants. INTENTION DETERMINATION entails that the existence of contexts like c_3, c_4 and c_5 is mutually exclusive. INTENTIONAL PAIRING, in turn, does not leave any room for contexts like c_1, c_2 and c_4. The latter suffices for blocking undesirable readings like (84b) and (94c), and the former ensures that, given a context, a complex demonstrative can only receive one reading. So far, so good.

However, in order for these two principles not to seem entirely *ad hoc*, King should find a way to justify them, for clearly they do not track semantic properties. They might be very reasonable when it comes to accounting for the regularities of actual contexts of use, but, precisely because of this, what these restrictions deal with is a contingent matter that depends on how the world happens to be. This is not a matter of meaning, much less a matter of logic, and it is therefore doubtful that these principles should be incorporated into the semantics of a language. In fact, if these principles were really a matter of semantics, it is not clear why King's theory should be any different from the ambiguity theories that we mentioned above and that King himself criticizes. By relying on J_1 and J_2, he is basically stating something like this: "if the speaker intends to talk about someone in particular, then the descriptive meaning of the demonstrative is context-dependent, and circumstance-dependent if she doesn't". This strikes me as a disjunction in disguise. It is in fact not too

different from stating something like "if a use of a complex demonstrative is referential, then it should refer to the demonstratum of the context and, if not, it should have the semantics of a definite description".[26]

Indeed, King is well aware that a principle like INTENTION DETERMINATION is "a matter of fact":

> "I note that we don't allow a bunch of different *f*s and *h*s here. We take it to be a matter of fact which properties are determined by an agent a's intentions at w, t for all contexts <a, w, t>, and (the particular) f and h encode these facts." (King 2001: 166; I adapted the terminology)

It is clear, then, that restricting contexts by means of this kind of principles is on a par with Kaplan's restriction to proper contexts. King's function *f*, or our equivalent principle of INTENTION DETERMINATION, is meant to "encode the fact" that, given an occurrence of a complex demonstrative, the intention relevant for determining its value in that context can be known simply by finding who the utterer is and in which world and time the utterance took place.[27] And INTENTIONAL PAIRING, equivalent to King's function *h*, is in turn devised to track the fact that an agent's intentions are always this or that way. But, clearly, none of these are logical facts. They belong, perhaps, to the metaphysics of utterances, which is related to, but distinct from, the study of meaning. In Kaplan's own words,

> "It is important to distinguish an *utterance* from a *sentence-in-a-context*. The former notion is from the theory of speech acts, the latter from semantics. Utterances take time, and utterances of distinct sentences cannot be simultaneous (i.e., in the same context). But in order to develop a logic of demonstratives we must be able to evaluate several premises and a conclusion all in the same context. We do not want arguments involving indexicals to become valid simply because there is no possible context in which all the premises are uttered, and thus no possible context in which all are uttered truthfully" (Kaplan 1977: 522).

[26] An ambiguity theory along these lines is developed by Georgi (2012; cf. his lexical entries in pp. 372-373). King thoroughly criticizes this kind of approaches (2001: §5).
[27] A similar point was made by David Lewis (1980): an agent, time and world should suffice for determining every other parameter of context.

Or, to borrow Kaplan's own example, one should make sure her logic does not rule out the possibility that sentences like (97) may be true at some contexts, even though they may never be employed truly:

(97) I say nothing

The reason why Kaplan's system does not count (97) as a logical contradiction is that it might be assessed in contexts *c* such that a_c is not speaking in w_c and t_c. Restricting the context in the appropriate manner could yield a different result, one that conflicts with our natural understanding of semantic and logical properties. INTENTION DETERMINATION and INTENTION PAIRING are not different from restrictions of this kind, i.e., constraints motivated by regularities and worldly conditions, instead of purely semantic features. In consequence, they may yield undesirable results; King's system is dangerously close to counting (96) as analytic, given his commitments.

I say "is dangerously close" because actually it does not. King does not state explicitly any clause to the effect that *f* and *h* should map contexts to the intentional object of the agent of the context in the world and time of the context, i.e., he does not state any principle equivalent to this one:

> WORLD-BOUND INTENTIONS: For any context *c*, the objects of a_c's intentions in i_c are R_c and J_c

It is clear from the above passages that King, in his informal discussion, endorses this principle; it seems to be, in fact, what justifies the other two. However, he never incorporates it in his formal theory, and, without such principle, it is straightforward that there are contexts in which (96) is false – i.e., it is not valid. This means that King, on the one hand, blocks undesirable readings like (84b), (77a) or (94c) by means of INTENTION PAIRING and INTENTION DETERMINATION (his functions *f* and *h*), and on the other he manages not to count (96) as valid by never stating a principle like WORLD-BOUND INTENTIONS as part of the semantics. So far the predictions are right, but one might wonder whether it is consistent to incorporate INTENTION PAIRING and INTENTION DETERMINATION into the semantics without thereby including WORLD-BOUND INTENTIONS too. I shall argue that it is not.

The main problem I see here is the role that King attributes to WORLD-BOUND INTENTIONS in informally justifying the other two principles. Because of this, it is hard to see how a semantics could incorporate INTENTION PAIRING and INTENTION DETERMINATION without, at the same time, including also the former, more basic principle. All three principles track non-logical worldly conditions, which means that they are formally on a par. And, in fact, the worldly conditions that WORLD-BOUND INTENTIONS tracks are the justification that King provides for INTENTION PAIRING and INTENTION DETERMINATION, meaning that it is more basic. In order to see this more clearly, let me introduce the facts tracked by each principle (assume, for the argument's sake, that King is right and all these facts are real properties of actual contexts):

> Worldly fact v_1: given an utterance *u* of a complex demonstrative, the property and the higher-order property that serve as arguments for the expression are always determined by the intentions of the utterer in the situation in which *u* takes place (this is tracked by WORLD-BOUND INTENTIONS)
>
> Worldly fact v_2: For any utterance *u* of a complex demonstrative *d*: if the property that *d* takes as argument is haecceitistic, then *d* will also combine with J_1, and if the property that *d* takes as an argument is descriptive, then it must combine with J_2 (this is tracked by INTENTION PAIRING)
>
> Worldly fact v_3: given an utterance *u* of a complex demonstrative by an agent in a world and time, there is only one possible property and only one higher-order property we can associate with *u* (this is tracked by INTENTION DETERMINATION)

If we assume King's arguments in the above passages, it seems that v_1 is a necessary condition for both v_2 and v_3. For example, the truth of v_2 requires three things: that a descriptive intention can only determine J_2, that a haecceitistic intention can only determine J_1, and that uses of complex demonstratives are always linked to an intention. If v_1 were false (say, if the value of a complex demonstrative could be determined by something other than an intention, or if agents had different intentional capabilities), then we would have no reason to hold that v_2 correctly represents any fact about complex demonstratives. And v_3, in turn, also depends on a feature of intentions: namely, that an agent can only have one intention at

a time in a certain world.[28] Thus v_3 and, more importantly, v_2, are relevant to the semantics of complex demonstratives only insofar as v_1 is true. If it were false, v_2 would be so too, and therefore INTENTION PAIRING would not be justified. And v_3, in turn, requires the truth of v_1 in order to enjoy a privileged status within the semantics of complex demonstratives, for, were it not for a certain (alleged) feature of intentions, we would have no reason to think that, given an agent, a world and a time, a complex demonstrative can only receive one value.

In other words, without v_1 it is impossible to justify the restrictions imposed by INTENTION PAIRING or INTENTION DETERMINATION. And, since WORLD-BOUND INTENTIONS tracks the facts in v_1, it is hard to see on what grounds it can be excluded from a semantics that does incorporate the other two. None of the three principles are logically justified, and the only thing that could be argued in their favor is that they represent how things in fact are. But WORLD-BOUND INTENTIONS is indeed more basic than the other two, and this means that the latter can represent how things are only in case they are combined with the former. If WORLD-BOUND INTENTIONS is excluded, the other two restrictions are not representing all the facts that are relevant to the use of complex demonstratives. This partial representation of how things are is what renders them on a par with *ad hoc* principles. Thus, anything that could justify the logical role that INTENTION PAIRING and INTENTION DETERMINATION play in King's semantics should also justify incorporating WORLD-BOUND INTENTIONS.

What I intend to show is that King cannot have it both ways: either all three principles are included in K3, or none of them is. But then King is at an impasse. If none of the three principles are included, he is unable to achieve the right results, for he predicts readings like (84b), (77a) or (94c), which he wants to exclude from his semantics. And, on the other hand, if he includes all three principles then he ends up with undesirable consequences like, as we have already mentioned, counting (96) as valid. I think this constitutes an important dilemma for K3. If this theory is not intended as a theory of use, then one might wonder why

[28] This assumption is far from uncontroversial, but I am granting it for the sake of King's argument. Arguably, however, a speaker may associate different intentions to a single utterance. Consider, for instance, inscriptions like "Jesus loves you" addressed to several readers, cases of deliberately ambiguous sentences, etc. I may, for example, write a single e-mail stating "I will meet you at the usual spot" and send it to two different people (García-Carpintero 1998: 535; example attributed to Josep Macià).

INTENTION PAIRING and INTENTION DETERMINATION should play any prominent role in the semantics. And, if it is intended as a theory of use, then there is no reason not to incorporate WORLD-BOUND INTENTIONS, too. So far my criticism of King's theory.

Other authors have raised yet further objections against King's system. For example, Braun (2008b) has pointed out that quantificational theories of complex demonstratives, and King's in particular, yield wrong results when it comes to the interaction of complex demonstratives and modal operators. For instance, K3 predicts that sentences like (98) have a reading in which they come out as false, but arguably they are unquestionably true:

(98) That man could have failed to exist

Assume that the utterer of (98) has a perceptual intention towards Benny Goodman. Given that quantifiers are usually assumed to be able to take both narrow and wide scope (a fact that King clearly endorses), this sentence, when assessed in a context *c*, may be taken to express either of the two following propositions:

(98a) Possibly, the individual that is a man in i_c and identical to Benny Goodman in i_c does not exist

(98b) The individual that is a man in i_c and identical to Benny Goodman in i_c possibly does not exist

The fact that Benny Goodman exists is a contingent matter, so (98) should be true *simpliciter*. Yet the ambiguity predicted by King's theory entails that this sentence has a false reading: (98a). This reading is true iff there is a possible world *w* such that there is an individual in *w* who happens to be identical to Benny Goodman in w_c and a man in w_c, and who does not exist in *w*. So it is in fact not just false, but also self-contradictory: it instructs us to see whether the domain of quantification of *w* contains an individual satisfying the aforementioned properties, and to assign truth if that individual is absent from the domain of quantification of *w*. Of course, this problem could be solved if we assumed that quantifiers like "all" or "every" are not restricted to possible worlds (i.e., that the domain of individuals is *constant*[29]), perhaps pairing this assumption with treating existence as a predicate, as in

[29] In fact, King (2001: 164) assumes a constant domain of individuals, although presumably he does so only for the sake of simplicity.

free logics, pretty much like Kaplan himself does (1977: 544). However, there are further modal problems that Braun raises to King's account.

One of these criticisms concerns non-redundant NDNS-uses. These are, recall, uses of a complex demonstrative of the form "that F" with a descriptive intention, with the additional requirement that, in the context *c* in which they occur, $[\![F]\!]^c \neq R_c$. Keeping with the above example, we could imagine that Greg, after learning that one student scored one hundred on the exam, engages in the following conversation with a fellow student:

> (99) Bob: I cannot believe that there could be someone able to score one hundred on the exam
>
> Greg: Well, that genius, if she exists, scored one hundred on the exam

Since Greg is unaware of that student's identity, it is reasonable to assume that, in this context *k*, R_k = *scoring one hundred on the exam*. This should be so, for Greg has no clue as to who that student might be, and that particular property is the only way of individuating her. As Braun argues, K3 predicts that Greg's utterance in (99) expresses, in this context, a necessary truth:

> (99a) If there is a unique individual *x* such that *x* satisfies *scoring one hundred on the exam* and *being a genius*, then *x* satisfies *scoring one hundred on the exam*

This is a highly undesirable consequence. Similarly, there are many contexts in which K3 would count the following examples as true, but arguably they should not be true in any context:

> (100) Necessarily, that table, if it exists, is red
>
> (101) Necessarily, that spy, if she exists, wears a blue hat

Let *c* be a context such that R_c = *being a red table*. On a narrow scope reading, (100) expresses a necessary truth in *c*, but arguably it should not. A similar story can be told about (101). These problems, however, are not restricted just to non-redundant NDNS-uses; for the redundant ones can also be problematic. For instance, a sentence like (100a) is intuitively false, yet, in a context in which the intention of the speaker is redundant, it can be given a reading in which it expresses a true proposition, namely one equivalent to (100b):

(100a) It could not have been the case that that red table in Fred's living room was completely green

(100b) It is not possible that the red table in Fred's living room is completely green

An analogous case can be constructed for similar examples. Imagine, for example, an NDNS non-redundant use of (101a) in a context in which no spy is following me. Intuitively, the sentence is not true – it may be false, it might express a gappy proposition or it may just be uninterpretable, but at any rate it cannot be true. However, and just as in all the other cases, King predicts that this sentence has a true reading, namely (101b):

(101a) It could have been the case that that spy behind me wore a blue hat

(101b) It is possible that there was a unique spy behind me and that she wore a blue hat

These and many other modal objections[30] led Braun to reject King's and any other quantificational approach to complex demonstratives, for most of them predict scope

[30] Braun (2008a) and Stanley (2002) raise yet another objection to King's theory. I chose not to discuss it in the body of the text because it depends on controversial assumptions about structured propositions and the notion of *aboutness*, but let me discuss it here. The objection builds on Soames' (2002a) argument against treating proper names as *actualized* definite descriptions in disguise. According to Soames, treating "Aristotle" as if it were equivalent to "the *actual* philosopher who wrote the *Metaphysics*" yields wrong results, for it would make the following sentence false:

(a) It is possible to have beliefs about Aristotle without thereby having beliefs about the actual world

But, arguably, (a) expresses a metaphysical possibility, and it is therefore true. This argument only holds in case the actual world is a constituent of the proposition expressed by the embedded sentence; in a non-structured framework, (b) and (c) are just equivalent:

(b) I believe that Aristotle was fond of dogs

(c) I believe that the actual philosopher who wrote the *Metaphysics* was fond of dogs

However, in a structured framework the truth of (c) would require me to believe a structured content containing the actual world as a constituent, whereas the truth of (b) wouldn't. Therefore, assuming contents are structured, proper names cannot be actualized definite descriptions – or, for that matter, they cannot be shortened forms of some "dthat"-term (see Corazza 2002a and Predelli 2015 for discussion).

Stanley (2002) points out (although does not elaborate on the point and, in fact, the reconstruction of the argument is carried out by King himself) that a version of this idea may be employed as an objection to King's account. Namely, (d) expresses a true metaphysical possibility, but King's framework, in which perceptual intentions always give rise to structured contents containing the actual world as a constituent, predicts that it should come out as false:

(d) It is possible to have beliefs about that man without thereby having beliefs about the actual world

On King's system, (d) would express (roughly) the following content:

(e) <Being possible, having beliefs about [the *x*: <being a man in @, x>, <being identical to *a* in @, x>] without thereby having beliefs about @>

Braun (2008b) raises a very similar objection. King's (2008a) response is that (d) does express (e), which is contradictory, but appeals to the other reading (d) has (i.e., one in which the complex demonstrative takes wide scope over the modal operator) and argues that the latter is the more natural and salient reading.

ambiguities of this kind. King (2008a) responded to these criticisms by claiming two things. In the first place, the very same arguments can be constructed for any other quantifier, and therefore they show nothing about complex demonstratives in particular. Consider (102):

(102) It could have been the case that someone who is actually here now failed to exist

Just like (98), this sentence seems intuitively true in any context. However, any theory that treats "someone" as a quantifier predicts that it has a false reading, namely, one that instructs the hearer to find a world containing an individual that fails to be in the domain of quantification of that world. This leads King to the second part of his argument: he claims that the ambiguities that Braun criticizes are actually there, but they are very difficult to hear because complex demonstratives have a strong tendency to take wide scope. This also explains our intuitions towards (99)-(101). Of course, some contexts may bring to salience the hidden readings.

However, Braun (2008c) points out that the difficulty in hearing a false reading for (102) is due to other factors. Consider the following contrast:

(103a) It could have been the case that some man failed to exist

(103b) It could have been the case that that man failed to exist

It is clear that (103a) displays ambiguities that (103b) does not, and King has no way to explain this. Additionally, Braun argues that King's judgment towards (102) is incorrect, and that the difficulty in hearing a false reading of this sentence is not due to pragmatic issues but, rather, due to the verbal morphology that the demonstrative contains (Braun credits Salmon for informally suggesting the idea). Namely, the verb "is" is in the indicative mood, whereas "failed", on the contrary, is in the subjunctive. Verbal moods are usually taken to refer to possible worlds (see section 3.3.1.2), and indicative in particular picks out the *actual world*. It is therefore no surprise that only a wide scope reading can be heard. (103a), on the contrary, contains no verbal morphology, and a narrow scope reading is much easier to get. But, importantly, the same contrast does not surface when complex demonstratives are involved: (103b), which contains no verbal morphology, still displays only a *de re* reading. I shall come back to related issues later, for, as I argue in sections 3.3.1.3 and 3.3.5, the role

of verbal morphology in licensing and barring certain readings is even greater than Braun suggests.

The exchange between Braun and King relies heavily on intuitions of modality that average speakers without philosophical background do not always share, and it is always possible to argue that the unnaturalness of most of the examples might be responsible for many of their judgments. For this reason, I would deem it inconclusive, although I shall come back to these issues in sections 3.3.5 and 3.4.2.1, where I argue that many of the ambiguities detected by King are dubious, and I suggest that the alleged narrow scope readings are better explained otherwise. Other critics of King's account include Dever (2001), Salmon (2006a, 2006b) and Nowak (2019a). I believe that the arguments I provided above, together with the ones by Braun and other critics, suffice for trying to find some alternative to King's K3.

2.2.2 Lepore & Ludwig's approach

The theory by Kirk Ludwig and Ernst Lepore (2000) is probably the second most developed quantificational account of complex demonstratives to date – as I already mentioned, other quantificational proposals are rather sketchy, and only suggested on the basis of syntactic uniformity with other determiner phrases. Their theory is, on my view, more elegant than King's, although it may subject to more modal criticisms. An important point that they make in their paper is that their theory is crosslinguistically supported, although, as we shall see, the very same evidence they cite will ultimately turn against them. Let us see what they argue for.

Essentially, their theory holds that complex demonstratives are determiner phrases with a rigidifying element. An important trait of their approach – one that may be in conflict with many theories of syntax – is that the occurrence of "that" within a complex demonstrative is still a simple demonstrative. These remarks may sound cryptic, but they can be made clear by means of an example. Consider the contrast between (104a-b):

(104a) That is huge

(104b) That man is huge

One might wonder what is the role of "that" in these two sentences. Average philosophers and linguists would treat "that" in (104a) as a context-dependent directly referential term. However, it is clear that the same story cannot be told about the "that" in (104b), for even advocates of direct reference need to say that what picks out an object in this sentence is not "that", but rather "that man". It seems, then, that directly referential theorists are committed to some sort of ambiguity theory: on some uses, the only role of "that" is to pick out an individual, whereas in others its functioning is more complex, because it needs to combine with a predicate before being able to select an object. This ambiguity theory is importantly different from the one we mentioned at the beginning of section 2.2.1.3, for it is not claiming that English contains a "that" for referential uses and another one for attributive uses; rather, it postulates a distinction between a *determiner* "that" and a simple *pronoun* "that". This distinction is somewhat parallel to Kaplan's second and third "dthat".

Albeit I believe that there are good reasons for thinking that these two "that" are in fact different lexical items (see below), ambiguity theories are in principle not quite attractive, which is why many authors have tried to provide a unified account of both roles of the term, reducing the pronoun as a special case of the determiner or *vice versa*. For example, King (2001, §4) suggested as a tentative hypothesis that bare "this" and "that" could be understood as quantifiers with a covert noun argument, and Elbourne (2008, §3.3; see also 2005) made a proposal along similar lines. Thus, both authors end up defending a version of the idea that "that" is always a definite determiner in need of completion by some arguments, pretty much like "the". Other authors endorsing an unambiguous treatment of "that" as a determiner include Taylor (1980), Barwise and Cooper (1981) and Salmon (2002), who regard bare demonstratives as the result of combining "that" with a trivial property or, simply, as a product of ellision. Lepore and Ludwig take the opposite path: on their view, the only role of "that" is the pronominal one.[31] Regardless of whether "that" is found isolated, as in (104a), or within a larger noun phrase, as in (104b), its only role is to pick out an object from the context, i.e., it always works as a singular referring term. According to them, any noun phrase

[31] Lepore and Ludwig (2000: 215, footnote 22) credit Willard Van Orman Quine (1960: 163) with an early implementation of this idea, although they acknowledge that his purposes were different, for he was aiming to eliminate demonstratives by replacing them, rather than to provide an explanation of how they work.

of the form "that" receives the following semantic value (assume that each context *c* contains a *demonstratum* or referent d_c):

$[\![\text{that}]\!] = \lambda c.\ \lambda i.\ d_c$

So far this not different from theories of direct reference. The innovation Lepore and Ludwig introduce lies in the way they suggest "that" combines with the nominal in order to obtain complex demonstratives, which they claim are quantifiers with no explicit determiner. The LF for any expression of the form "that F is G" is given below, and it is to be interpreted by means of the syncategorematic lexical entry they postulate (the terminology employed is a mix between theirs and mine; I explain the relevant changes below):

(105a) LF: "[That *x*: F*x*] (G*x*)"

(105b) For all contexts *c* and circumstances *i*, $[\![\text{[That } x\text{: F}x\text{] (G}x\text{)}]\!]^{c,\,i} = 1$ iff the *c'* such that *c'* differs from *c* at most in that $g_{c'}(\text{"}x\text{"}) = d_c$ and $[\![\text{F}x]\!]^{c',\,i} = 1$ is such that $[\![\text{G}x]\!]^{c',\,i} = 1$

(105a-b) require some explanation. (105a) is a variant the typical form that all generalized quantifiers take in the classical theories of these expressions (cf. Sharvy 1969, Barwise & Cooper 1981, Higginbotham & May 1981, Neale 1990a; these authors often talk of "restricted quantifiers" instead). In these theories, every sentence of the form "DF is G", where "F" and "G" are predicates and "D" is a determiner, receives an LF like the following: "[D*x*: F*x*] (G*x*)". The determiner, then, specifies some conditions that both formulae, "F*x*" and "G*x*", need to satisfy in order for the whole sentence to be true: for example, "[All *x*: men (*x*)] (mortal (*x*))" is true under an assignment *g* iff every *g'* such that *g'* differs from *g* at most in the value it assigns to *x* and satisfies "*x* is a man" is such that *g'* satisfies "*x* is mortal".[32] And (105b) is, essentially, a variant of this kind of lexical entries (the reason why I talk of contexts instead of assignments is, simply, that I am assuming that the assignment is part of the context). Of course, "that" is still a referring term in (105b); it is the whole expression "that F" which has quantificational status.

[32] Here are some extra examples, just in case it was not clear enough:
"[Some *x*: men (*x*)] (mortal (*x*))" is true under an assignment *g* iff there is at least a *g'* such that *g'* differs from *g* at most in the value it assigns to *x* and satisfies "Fx" and "Gx"
"[Most *x*: men (*x*)] (mortal (*x*))" is true under an assignment *g* iff the majority of *g'* such that *g'* differs from *g* at most in the value it assigns to *x* and satisfies "Fx" are such that *g'* satisfies "Gx"

Thus, Lepore and Ludwig assume that complex demonstratives have the form of a generalized quantifier and that they might be interpreted accordingly, as (105b) makes clear. Notice, in fact, that (105b) entails that "that F is G" is equivalent to "[the *x*: F*x* & *x* = that] (G*x*)" (Lepore & Ludwig 2000: 215). There is, however, a fundamental difference between complex demonstratives and other generalized quantifiers, for, as we have already mentioned, "that", on their theory, is not a determiner, but a referring term. Thus, every quantifier has the form "[D*x*: F*x*]", but complex demonstratives are slightly different, for the determiner "D" is completely absent from the superficial form of (105a). As Lepore and Ludwig acknowledge, these are not the only determiner phrases with no overt determiner: for example, generic noun phrases like "whales" in "whales are mammals" are often assumed to be quantificational.

In sum: "that" is always a referring term, yet on occasions it might combine with a nominal in order to return a quantified expression with no overt determiner. The result is a complex demonstrative, whose syntax is somewhat akin to that of, say, generics, and whose semantics is just like that of any other quantifier: a function from properties to truth-values. Thus, they avoid treating "that" as an ambiguous term. Of course, we are owed an explanation of how such combination is even possible, and in this respect what they offer is crosslinguistic evidence that demonstratives may undergo such kind of combinations in other languages. We have already mentioned one of their examples:

(76a) Aquel hombre lleva sombrero

That man wears hat

"That man wears a hat"

(76b) El hombre aquel lleva sombrero

The man that wears hat

"That man wears a hat"

As stated above, Spanish may construct complex demonstratives in these two different yet semantically equivalent ways. Importantly, the complex demonstrative in (76b) contains an explicit determiner, yet it means exactly the same as (76a). This, Lepore and Ludwig

argue, strongly suggests that complex demonstratives are quantifiers: in Spanish, the determiner may remain covert or may raise to surface, whereas in English it is always covert. At the semantic level, however, they are identical. They even provide evidence from languages in which the use of the definite article is mandatory, i.e., languages in which the only grammatical form of complex demonstratives is the one displayed in (76b) – they mention Hungarian, Haitian Creole, Welsh, Dehu, Greek, Hebrew and Mandingo. In fact, English itself allows many combinations of determiner + demonstrative, whereas combinations of determiner + determiner (often) result in ungrammaticality:

(106a) ^{OK}All those people are funny

(106b) #Some all people are funny

(106c) #Every most people are funny

According to Lepore and Ludwig, the facts in (106a-c) strongly suggest that the demonstrative "those" is not a determiner.

As we shall see later, all these pieces of evidence are dubious. Let us first see the semantic problems their theory is subject to. One obvious inconvenient is that, insofar as they allow the descriptive meaning of complex demonstratives to be circumstance-dependent, and insofar as all uses of complex demonstratives are rigid, they predict that sentences like (77) and (94b) display readings they shouldn't. For example, the lexical entry in (105b) predicts two possible readings for (94b) interpreted in a context in which d_c = Angela Merkel:

(94d) λi. The *x* such that *x* = Angela Merkel & *x* wears a coat in *i* is such that, in all circumstances *j* compatible with what Emmanuel believes in *i*, *x* is sympathetic in *j*

(94e) λi. In all circumstances *j* compatible with what Emmanuel believes in *i*, the *x* such that *x* = Angela Merkel & *x* wears a coat in *j* is such that *x* is sympathetic in *j*

The descriptive meaning of the demonstrative is circumstance-dependent, and this entails that, when the expression takes narrow scope, we get a reading like (94e). And this reading is equivalent to (94c): Emmanuel has to believe that Merkel is wearing a coat. Another wrong prediction concerns QI readings (Nowak 2014), for Lepore and Ludwig's

theory is unable to get rid of rigidity.[33] In a context whose *demonstratum* is William Howley, the truth-conditions their theory predicts for (77) are given below:

> (77c) λi. [∀*x*: *x* is a queen in *i*] (*x* cherishes in *i* the *y* such that *y* = William Howley and *y* crowned *x* in *i*)

Of course, (77c) suffers from the very same problems that directly referential theorists were subject to: (77) should not be about William Howley nor about anyone in particular.

The response of Lepore and Ludwig provide against the criticism concerning attitude reports is very similar to King's: the implausible reading is available, although very difficult to hear, but it can be brought to light in certain contexts. For example, imagine that Merkel is actually wearing a jacket and Emmanuel knows it. I mistake Merkel's jacket for a coat and utter (94b). Then my interlocutor – say, Giuseppe – may correct me by uttering (94f):

> (94f) No, Emmanuel does not believe that that woman *with a coat* is sympathetic, he believes that that woman *with a jacket* is sympathetic

This, they argue, shows that the descriptive meaning of the demonstrative is not opaque to modal quantification. Now, it seems to me that this response is just wrong, for what is going on in this example strikes me as a clear case of *metalinguistic negation* (Horn 1985). Consider (107)-(110):

> (107) I did not meet *a woman*. I met *my wife*
> (108) We don't *like* L.A. We *love* it
> (109) Fred *does not regret* failing the exam. He *passed* it
> (110) Mary *has not stopped* smoking. She has never smoked

In (107)-(108), it is clear that the negation in the first sentence cannot be operating on the literal content of the sentence: if somebody meets her wife, she meets a woman, and anybody who loves L.A. also likes it. As for (109)-(110), the negation seems to be operating not on the literal content of the sentences but, rather, at the level of presupposition – i.e., it is denying the presuppositions triggered by "regret" and "stop" in these examples, namely that Fred failed the exam and that Mary used to smoke. The usual thesis for explaining what is

[33] Their theory does make some good predictions about QI, though. See the discussion on sentence (132) below.

going on in these examples is a pragmatic one: namely, that "not" is not being used for denying the content of the sentences under its scope, but rather for correcting the choice of words. For example, saying something like "Tom likes L.A." may lead the hearer to infer, through Grice's maxim of quantity, that Tom merely likes, and does not love, the city; similarly, saying "Fred does not regret failing the exam" triggers a presupposition to the effect that Fred failed it. The utterer of (108)-(109) is, simply, suggesting a better way to put what her interlocutor intended to convey – hence the name "metalinguistic negation".

Here is a modified example that shows that what is going on in (94f) is better explained along the lines of metalinguistic negation. Imagine Merkel is in fact wearing a coat, but Emmanuel mistakenly thinks she is wearing a jacket. Again, I point at Merkel and utter (94b). It seems clear to me that a correction along the lines of (94f) does not make much sense in such scenario, even though Emmanuel does believe that Merkel is wearing a coat. In the other scenario, it made sense for Giuseppe to say something like that, because he was correcting, at the metalinguistic level, something false I conveyed by means of my utterance – namely, that Merkel was wearing a coat. But, in a scenario in which Merkel is wearing a coat, such correction is out of place, even if Emmanuel believes she is wearing a jacket.[34] This shows that what Giuseppe is correcting in the former scenario is not my attribution of a belief to Emmanuel, but rather my own belief. Lepore and Ludwig mistakenly predict that (94f) should be right in the latter situation. Notice, in fact, that standard quantifiers do display ambiguities like the ones erroneously predicted by Lepore and Ludwig, i.e., ambiguities analogous to those in (94e-d):

(94g) Emmanuel believes that a woman with a jacket is sympathetic

If Emmanuel believes that Merkel is wearing a jacket and that she is sympathetic, but Merkel is in fact wearing no jacket, (94g) may have both a true and a false reading. The fact that things are different in the case of "that" is indicative that complex demonstratives are

[34] Or, at least, it sounds no better than the following correction:

- (Pointing at Clark Kent dressed as a civilian) "Lois Lane believes that he can fly"
- "No, she believes that *Superman* can fly"

This correction can make sense at some pragmatic level, but it is clear that what is being corrected here is not the content of the utterance.

not quantifiers; if they were so, they should be able to give rise to *de dicto* readings. In section 3.4.2.1 I shall discuss an additional example they provide.

An additional worry about Lepore and Ludwig's account concerns the unorthodox syntax they make use of. My criticism here is essentially an elaboration of the critique that King (2001: 178-179, footnote 6) posed to their account, but let me first introduce a couple of syntactic notions just to make it clearer. For simplicity's sake, let me frame the debate in terms of noun phrases instead of determiner phrases,[35] i.e., assume that "all men", "most people" or "some children" are the result of combining a determiner with a nominal N´. Borrowing some terminology from (early) X-bar theory (Chomsky 1970, Jackendoff 1977 and much subsequent work) we may state the rules for generating noun phrases thus (a parenthetical indicates that the element is optional):

(111a) NP → (D) + N´

(111b) N´ → (AP) + N´ *or* N´ + (PP)

(111c) N´ → N + (PP)

These are rules licensing the introduction of certain elements into a sentence (sentences, in turn, are governed by a rule like S → NP + VP). As (111a) states, noun phrases are composed of an optional determiner and an intermediate projection N´ (what I have been calling a "nominal" throughout this dissertation). (111b), in turn, means that an N´ licenses the introduction of another N´, optionally accompanied by either an adjectival phrase or a prepositional phrase. This rule may be iterated as many times as one wishes. And, as the last rule states, an N´ also licenses the introduction of a noun (the head of the noun phrase) optionally followed by a prepositional phrase, but this rule cannot be iterated (i.e., there can only be one head per phrase). Let us see an example of a derivation to see how it works:

[35] King also formulates his argument in terms of noun phrases instead of determiner phrases. However, most authors in the generativist tradition (Stowell 1989, Chomsky 1995/2015, Sag et al 2003) follow Abney (1987) in holding that the head of what has been traditionally called an "NP" is actually a determiner, meaning we should talk of "DP" instead – they acknowledge that NP's (phrases headed by a noun) exist, but what ultimately combines with a verb phrase (VP) in order to obtain a sentence is a DP. Others (cf. Bruening 2009) have argued against the DP hypothesis and in favor of maintaining the traditional notion.

NP → the N′ (by (111a))

the N′ → the small N′ (by (111b))

the small N′ → the small N′ with a nice cover (by (111b))

the small N′ with a nice cover → the small blue N′ with a nice cover (by (111b))

the small blue N′ with a nice cover → the small blue book of linguistics with a nice cover (by (111c))

These rules are able to generate virtually every noun phrase of English. But, as King points out, none of them is able to generate the kind of structures Lepore and Ludwig require. They need a rule like the following:

(112) NP → NP + (N′)

I.e., they need that a full-fledged noun phrase like "that" (which, on their view, is a referring term which can be employed on its own, with no accompanying syntactic material) be capable of combining with further noun phrases in order to generate a quantified expression (i.e., another noun phrase). The problem with (112) is that it massively overgenerates, for it licenses constructions like the following, where the main noun phrase results from the combination of a full-fledged noun phrase and an N′:

(113a) #She good student is intelligent

(113b) #John plumber came yesterday

(113c) #The kid son of John came yesterday

Of course, Lepore and Ludwig could respond that every X-bar rule overgenerates, and that all of them need some kind of qualification – say, by means of the Θ-criterion. In fact, there is a small range of expressions that do seem to follow the pattern of (112):

(114a) ^{OK}You guys are doing great

(114b) ^{OK}We Americans are a great nation

However, this response seems unconvincing, for two reasons. In the first place, cases like (114a-b) are the exception rather than the norm; complex demonstratives display a systematicity that the expressions in these two sentences do not seem subject to. More

importantly, if we are willing to provide a plausible account of the semantics of "you guys" or "we Americans", I doubt that the first hypothesis one would think of is that they are quantifiers. If complex demonstratives are to be assimilated with expressions of this kind, then whatever story could be told about "you guys" or "we Americans" should also work for "this guy" or "that American". But, at least *prima facie*, the former seem as referential as "you" or "we".[36]

Let me discuss now some of the grammatical evidence that Lepore and Ludwig provide in favor of their theory. In the first place, the facts in (106a-c) are far from conclusive, for English does display combinations of determiner + determiner:

(106d) All the leaves are brown

Nobody doubts that "the" is a determiner, so the existence of sentences like (106d) undermines the idea that the well-formedness of (106a) is due to "those" being a pronoun. I do not have an account that explains the contrast between (106a) and (106d), on the one hand, and (106b-c) on the other, but plausibly it has to do with the definite status of the determiner (Barwise & Cooper 1981: 183-184). Namely, both "the" and "those" are *definite*, i.e., determiners employed for (loosely speaking) selecting a unique set of individuals (see Roberts 2003 and Elbourne 2005 for thorough characterizations of English definite noun phrases). It does not show that "that" is still a pronoun in (106a).

This leads me to the next piece of evidence. In order for Lepore and Ludwig to be able to claim that (76a-b) constitute evidence in favor of their theory, they need to assume that the word "*aquel*" ("that") appearing in these sentences is a pronoun; that would provide evidence

[36] There is, however, an important source of evidence in favor of dealing with complex demonstratives in these terms: prosody. English monosyllabic determiners are usually *non-tonic*, i.e., they do not display syllabic stress. For example, determiners like "a" or "the" sound as if they were non-tonic syllables:

(f) I found a cat ("a" is pronounced [ə])

(g) I found the cat ("the" is pronounced [ðə])

When stress is put on the determiner, they may sound differently:

(h) I did not find "some" cats. I found *a* cat ("a" is pronounced [eɪ])

(i) I did not find just some street cat. I found *the* cat ("the" is pronounced [ði])

The "this" and "that" found in complex demonstratives are exceptional in this respect, for they are most usually stressed in spite of being monosyllabic. And, importantly, this is also the case of the pronouns in (114a-b), which receive their usual pronunciation – i.e., they are stressed. Lepore and Ludwig do not consider this piece of evidence, but it might be worth exploring. It is also important to note, however, that these facts are not true crosslinguistically.

that their unorthodox syntax is found in other languages. They argue that the Spanish sentence (76b) is simply a version of (76a) in which the determiner raises to surface, and on the basis of these examples they argue that the same kind of structure can be found in English, even if the determiner is always covert in this language. However, things are more complex, for the word "*aquel*" ("that") in the Spanish examples is clearly not a pronoun. Let us see why. The first thing to notice is that Spanish, unlike English, marks an explicit distinction, at the morphological level, between "this/that" as a pronoun and "this/that" as a determiner/adjective. Consider the following examples, containing "*esto*/*esta*/*este*" ("this"):

(115a) Esto es grande

This is large

(115b) Esta mesa es grande

This table is large

(115c) Este perro es grande

This dog is large

The demonstrative in (115a) is simple, whereas those in (115b-c) are complex. The important thing to bear in mind here is the gender inflection of the words. In the latter case the demonstratives must agree in gender with the noun they combine with, i.e., with "*mesa*" and "*perro*" ("table" and "dog"), whose grammatical gender is feminine and masculine, respectively. It is for this reason that the demonstratives in these examples take the forms "*esta*" (for the feminine) and "*este*" (for the masculine). On the other hand, the demonstrative in (115a) is simple, meaning that it has no noun to combine with, and therefore it cannot take any sort of inflection; instead, it takes a nowadays fossilized neutral gender termination "*-o*", yielding "*esto*" as a result.[37] The fact that "*esta*" and "*este*" are required to agree in gender with the noun they modify is indicative that they are not pronouns; "*esto*", on the contrary, can be employed for referring to any object whatsoever regardless of grammatical gender:

[37] Etymologically, Spanish "*este*", "*esta*" and "*esto*" come from the Latin adjectival demonstratives "*iste*", "*ista*" and "*istud*", which were employed respectively for the masculine, feminine and neutral gender. In Spanish, as in most Romance languages, the latter gender was lost and the neutral words were assimilated into the masculine gender (e.g., the neutral Latin word "*caelum*", "heaven" or "sky", evolved into the masculine word "*cielo*" in Spanish). This does not mean that "*esto*" is masculine in Spanish; if it were so, it would take the termination "-e". "*Esto*" is pretty much like a demonstrative version of the English pronoun "it".

(115c) (Pointing at a table) [OK]Esto es grande

This is large

Unlike "esto", determiners do change their shape on the basis of grammatical gender requirements, which constitutes good evidence that the inflected "*este*" and "*esta*" in (115b-c) belong to the latter class of expressions. Compare with other determiners:

(116a) La mesa es grande

The table is large

(116b) El perro es grande

The dog is large

(116c) Algunas mesas son grandes

Some tables are large

(116d) Algunos perros son grandes

Some dogs are large

As (116a-b) show, the determiner "the" needs to agree in gender with the noun it combines with: it takes the form "*el*" when it is modifying a masculine term and "*la*" when it is followed by a feminine one, and exactly the same story can be told about "*algunos*/*algunas*" ("some") in (116c-d). These facts show that the grammatical functioning of "*este/esta*" is analogous to that of determiners. Parallel arguments can be constructed to the effect that "*aquel*" ("that") is an adjective, and not a pronoun in (76b). Consider the following example containing the bare demonstrative "aquello":

(117) Aquello es grande

That is large

Just as above, the demonstrative cannot be realized in its masculine form "aquel" when it is found isolated; instead, it must take the neutral fossilized inflection "-o", resulting in "*aquello*" (although see the discussion below). By contrast, "*aquel*" in (76b) displays masculine inflection, as required by feature agreement with "man". This strongly suggests

that "*aquel*" is an adjective and not a pronoun, for, in Spanish, adjectives are also required to agree in gender with the noun they modify:

(118a) El hombre alto lleva sombrero

The tall man wears (a) hat

(118b) La mujer alta lleva sombrero

The tall woman wears (a) hat

The adjective "*alto*" ("tall") takes the forms "*alto*" and "*alta*", respectively, when it combines with a masculine and a feminine noun. This behavior parallels that of "*aquel*". All these facts show that Spanish (76b) is not grammatically equivalent to Lepore and Ludwig's proposal for understanding English "that", i.e., it is not a case in which the noun combines with a pronoun and the determiner raises to surface. Similarly, (76a) is not the result of combining a pronoun and a noun: rather, it is a determiner phrase with an explicitly marked determiner. Thus, Lepore and Ludwig's claims are not crosslinguistically supported, at least not by Spanish. If they want to find the kind of structure they need, they will have to look elsewhere.

I believe, however, this point generalizes: it is a crosslinguistic fact that the construction of complex and simple demonstratives employs very different mechanisms and, more relevantly, different lexical items. As we have just seen, simple demonstratives are constructed in Spanish just like their English counterparts, i.e., by means of a pronoun, whereas the complex ones may be constructed either by means of a determiner or by means of an adjective.[38] Arguably, the lexical items involved in each of these two processes, "*esto*" and "*este*/*esta*" respectively, are not just morphological variants of a single word: they may be regarded as *different words*. The very same phenomena are also attested in other Romance

[38] As the data show, Spanish "este" can work either as a determiner or as an adjective. This seems to be an instance of a more general phenomenon, very common in Romance; for example, in most dialects of Catalan the following possessive phrases are completely interchangeable:

(j) El meu pare
The my father
(k) Mon pare
My father

"My" works as an adjective in (j) and as a determiner in (k); the facts seem entirely analogous to those in (76a-b). The interchangeability of these two roles is also found, although to a more limited extent, in Romanian and Occitan (data from Ledgeway 2012).

languages: Ledgeway (2012) cites Catalan, Occitan and Romanian as displaying the very same pattern as Spanish. On the other hand, Italian and Portuguese do not allow constructions like (76b), but the behavior of their respective equivalents of "that" in constructions like (76a) is definitely like that of determiners, in stark contrast with demonstrative pronouns.

This is not something idiosyncratic to Romance languages, however. Japanese, for example, employs two different words for constructing demonstratives: "*kore*", "*sore*" and "*are*", corresponding to English "this", "that" and the archaic "yon", can only be employed on their own (i.e., as pronouns), whereas "*kono*", "*sono*" and "*ano*" can only be used in combination with a nominal (that is, for constructing complex demonstratives). Mandarin Chinese provides an even more striking piece of evidence for these facts. In Mandarin, as in most Sinitic languages, determiners do not combine directly with a noun: such combination is (usually) mediated by so-called "*classifiers*". Although Mandarin lacks most of the English determiners, this phenomenon can be exemplified by means of numerals and *wh*-determiners:

(119a) Na *ke* pingguo?

What CLAS. apple? ("ke" is a classifier for round things)

"Which apple?"

(119b) Yi *ge* ren

One CLAS. person ("ge" is a generic classifier)

"A person"

(119c) Ji *ben* shu?

How many CLAS. books? ("ben" is a classifier for books)

"How many books?"

The important thing to bear in mind here is that the Mandarin words for "this" and "that", "*zhe*" and "*na*" respectively, can take two grammatical functions: they may be employed on their own or they may accompany a noun. Of course, these two roles correspond to simple and complex demonstratives in English. And, relevantly, when they accompany a

noun they display a feature that strongly suggests that they are determiners: they are normally accompanied by a classifier.[39] Consider the following Mandarin complex demonstratives:

(120a) Zhe *ge* ren

This CLAS. person

(120b) Na *ben* shu

That CLAS. book

Pronouns do not combine with classifiers, which shows that "zhe" and "na" are playing an entirely different role in these examples. Speaking in more general terms, the fact that English does not mark an explicit distinction between pronominal "this" and "that" and their determiner counterparts, either at the lexical or at the morphological level, should not lead us to infer that they are the same lexical item. Chinese, Japanese and Romance languages do display this distinction. It is therefore implausible to assume a semantics like the one Lepore and Ludwig assume: the syntactic structure they need, in which the occurrence of "that" within a complex demonstrative is itself a referring term, would be almost unique to English.[40] In sum, it appears to be a crosslinguistic fact that there are at least two kinds of demonstratives, summarized in the table below (see Diessel 1999 for a much more extensive classification):

[39] Although the use of classifiers after a demonstrative is actually optional (Sun 2006: 159), they are normally not omitted.

[40] Complex demonstratives in some languages, like Tuscaoara (an almost extinct Iroquoian language spoken in Ontario, Canada), have been analyzed as the result of allowing pronouns to be juxtaposed to nominals (Mithun 1987). However, in this language the nominal is only loosely attached to the pronoun, for its functioning is pretty much like an apposition. In this kind of languages, the demonstrative and the nominal can often be separated by intermediate constituents (Diessel 1999: 61), which is of course not the case of English. The idea that the "that" appearing in a complex demonstrative is still a pronoun would make English unique among its closely (and not so closely) related languages.

	A) Determiner and adjectival demonstratives	B) Pronominal demonstratives
Syntax	They require an N´ in order to construct an NP (or another N´ in the case of adjectives).	They constitute an NP on their own.
Morphology	They display Φ-featural agreement with their sister N´.	They need not agree with the grammatical features of the name of the thing referred to.
Examples	Japanese: *kono, sono, ano* Mandarin: *zhe*+CLAS., *na*+CLAS. Spanish: *este/a, ese/a, aquel/la*	Japanese: *kore, sore, are* Mandarin: *zhe, na* Spanish: *esto, eso, aquello*

So Ludwig and Lepore's thesis is that English has only type-B demonstratives. And, as we have already mentioned, Taylor (1980), Barwise & Cooper (1981), King (2001) and Elbourne (2005, 2008) settle for the opposite idea: English contains only type-A demonstratives, but the N´ they need to combine with is sometimes covert. And there is, of course, still a third possibility one might argue in favor of: namely, that English contains both types of demonstratives, although they display exactly the same superficial form regardless of their grammatical function, perhaps as a consequence of the impoverished inflectional system of English. Let me dub these three positions "pronominal thesis", "adnominal thesis" and "dual thesis", respectively.

In order to argue in favor of the first of these theses, Lepore and Ludwig require the adoption of an unorthodox syntactic construction, one that is not easily found in other languages (as we have already seen, (76b) does not constitute evidence for their claims, for the demonstrative it contains is clearly type-A; I remain agnostic about the other languages they mention, albeit I suspect that they display similar distinctions). By contrast, the dual thesis does enjoy crosslinguistic support, simply because of the very existence of the required distinction. There are, however, a couple of arguments that might be employed for undermining the dual thesis. Let me briefly present them, for discussing these two problems will help me not just further criticize Lepore and Ludwig's approach but, additionally, raise some doubts about the adnominal thesis.

The first problem concerns the data employed. Namely, I did not mention a certain possibility: perhaps type-A demonstratives can occur on their own, i.e., with no

accompanying N´. This is in fact what happens in Spanish and Chinese, where it is possible to employ, say, "*aquel*" and "*na ge*" followed by no noun phrase. The following sentences are grammatical in both languages:

(121a) Aquel es alto

That-MASC. is tall

"That (one) is tall"

(121b) Na ge hen gao

That CLAS. very tall

"That (one) is tall"

The existence of these cases may play in favor of Lepore and Ludwig. Let me construct an argument on their behalf: while it is true that type-B demonstratives can never combine with nominals, the facts in (121a-b) show that type-A demonstratives do display pronominal uses. Once this is acknowledged, it is only natural to assume that they are, in fact, always pronominal, and that their combination into larger noun phrases proceeds by the mechanism they have described or some other way. And, of course, these arguments could hold for any language.

This argument, however, is flawed, and the English translation I provided for (121a-b) is indicative of why it is so: the demonstratives in these sentences are *complex* and *elliptical*. This is, in fact, the reason why they can only be translated into English as "that one" instead of "that": they require combination with a N´, but the N´ in these sentences is elided. Let me introduce a few syntactic notions in order to explain this. One of the tests for diagnosing syntactic constituency in English is the so-called "*one*-substitution test": if a string of words can be replaced for "one" and the result is grammatical, then that string is a syntactic constituent of the sentence, and more concretely an N´. For example, the word "one" can substitute many of the constituents of the following sentence:

(122a) The black dog with brown spots that I saw yesterday was very friendly

(122b) The black one with brown spots that I saw yesterday was very friendly

(122c) The one with brown spots that I saw yesterday was very friendly

(122d) The one that I saw yesterday was very friendly

(122e) The black one was very friendly

...

I.e., "one" can replace "dog", "black dog", "black dog with brown spots", "dog with brown spots that I saw yesterday", etc. All these are N´. In other languages, however, the "one"-substitution test does not work, for the word "one" does not have this role. Instead, the test is, simply, N´-ellipsis. Consider the following sentences in German (extracted from Carnie 2013; "Ø" indicates an elision):

(123a) Die schlanke Frau aus Frankreich isst Kuchen mit Sahne

The thin woman from France eats cake with cream

(123b) Die Schlanke Ø aus Frankreich isst Kuchen mit Sahne

The thin Ø from France eats cake with cream

(123c) Die Ø aus Frankreich isst Kuchen mit Sahne

The Ø from France eats cake with cream

(123d) Die Ø isst Kuchen mit Sahne

The Ø eats cake with cream

I.e., this test is more or less equivalent to the "one"-substitution test. The translation shows that, with the exception of (123d), the elided material in German should have been replaced for "one" had we been dealing with English: "the thin one from France", "the one from France", etc. Let us now go for the main point: Spanish and Mandarin pattern with German when it comes to diagnosing constituency, for both languages elide their respective N´ instead of replacing them for "one". This suggests that the demonstratives in (121a-b) are complex demonstratives with an elided N´, an idea that is further confirmed by two facts. In the first place, (121a-b) do not sound entirely felicitous on their own, but they improve when some linguistic context is provided, particularly when an anaphoric antecedent for the demonstrative is available. In the second place, and more relevantly, the fact that they can only be translated into English as "that one" instead of "that" shows that the missing material

is elided, for ellipsis is the equivalent of "one"-substitution in Spanish and Mandarin. Thus, there are good reasons for thinking that the demonstratives in (121a-b) are complex, and therefore that "that" is not pronominal in these examples. They in fact constitute another source of counterevidence to Lepore and Ludwig's idea that complex demonstratives in other languages can be the result of syntactically combining a pronominal demonstrative (an NP) with an N´. If it were so, then the hypothesis that "*aquel*" and "*na ge*" in (121a-b) are pronouns should be minimally plausible, but, given that they can only be translated into English as "that one", the hypothesis does not even get off the ground.[41]

On the other hand, I believe that these facts also offer compelling arguments against the adnominal thesis. Defenders of this approach hold, recall, that bare demonstratives are just complex demonstratives with some kind of covert argument. A straightforward way to state this thesis is that bare demonstratives are, simply, complex demonstratives with an elided nominal; as Salmon puts it, the "*NP may be deleted to form a bare demonstrative*" (Salmon 2002: 524). This idea is *prima facie* attractive, but it may turn to be problematic, for English does not usually allow eliding an N´ when it is attached to a determiner: as we have just seen, the N´ should be substituted for "one" instead. Thus, if the adnominal thesis were right we would expect all bare demonstratives to be realized as "that one", instead of simply "that". Clearly, this shows that bare demonstratives cannot be formed from eliding material from a complex demonstrative. To put it differently, if (124b) were the result of eliding the nominal "table" in (124a), then (124d) and (124f) should be equally grammatical.

(124a) That table is huge

(124b) That is huge

(124c) The table is large

(124d) #The is large

[41] The *New Basic Grammar of the Spanish Language* (Real Academia Española 2009), a normative document, supports this idea. Paragraphs 1.9o and 1.9p of this work state that, even though some grammarians have traditionally dealt with "*aquel*" and "*aquella*" as ambiguous between a pronoun and a determiner, current trends find it much more empirically plausible to analyze bare "*aquel*" and "*aquella*" as the result of elision. See also the paragraphs 15.2e-h and 17.2b of the same work.

(124e) No table is large

(124f) #No is large

Let us nevertheless grant that English may allow eliding an N´ attached to a determiner (not an unreasonable idea, after all, for it may account for the grammaticality of sentences like "some came to the party"). Even so, the adnominal thesis would still find itself in trouble when it comes to accounting for the data in other languages. If type-B demonstratives are nothing but type-A demonstratives with a covert N´, then we should expect type-B demonstratives to display the same morphology as type-A demonstratives with an elided N´, i.e., if the adnominal thesis were right then a sentence like (117), repeated below, should be the result of eliding some kind of nominal material within the NP. But this cannot be so, for re-introducing the elided material results in ungrammaticality. (117) contains a bare demonstrative, and, as the facts in (117a-b) show, this demonstrative cannot be made complex by attaching a nominal to the pronoun:

(117) ^{OK}Aquello es grande

That is large

(117a) #Aquello armario es grande

That wardrobe is large

(117b) #Aquello puerta es grande

That door is large

This shows that a bare demonstrative cannot be the result of eliding material in a complex one. In fact, the process of elision yields very different results in Spanish. Namely, the determiner is still required to agree in gender with the elided noun:

(117c) Aquel armario es grande → Aquel Ø es grande

That wardrobe is large → *That Ø is large* ("That one is large")

(117d) Aquella puerta es grande → Aquella Ø es grande

That door is large → *That Ø is large* ("That one is large")

Analogous facts hold for Mandarin demonstratives: the elision of an N´ requires that the classifier still be combinable with the noun. This evidence is non-conclusive, and it is always open for defenders of the adnominal thesis to argue that hidden arguments are in no way equivalent to elliptical material, yet I think it provides good evidence that the dual thesis is on the right track.

Let me consider now a second argument, one that could be employed both by Lepore and Ludwig and by defenders of the adnominal thesis. It goes like this: the words in each of the two categories of demonstratives are just too similar to be regarded as different lexical items. How come that "*ese*" and "*eso*" are different words, in spite of looking so similar and having such closely related meanings? Isn't it more plausible to regard them as the same word with a different morphology? How can the dual thesis explain the systematic way in which Japanese speakers transit from "*kore*" to "*kono*", from "*sore*" to "*sono*" and from "*are*" to "*ano*", given the similarity of the two sets of demonstratives? This is a fair worry, and in fact it appears to be the main motivation for seeking a unified semantics for type-A and type-B demonstratives. In particular, the hypothesis that all these words are just morphological variants of a single word is attractive, and a theory formulated in those terms would be very elegant and simple.

In the first place, the dual thesis is not incompatible with the idea that type-A and type-B demonstratives are just morphological variants of the same word; the only extra requirement is that they should be, additionally, semantic and syntactic variants of the same word. But, even if this were implausible (say, if we wanted to individuate words by their semantics, and if therefore the idea of "semantic variants of a word" were self-contradictory), I believe that the systematicity described above can be explained by other means. Namely, it might just be a matter of etymology: perhaps type-A and type-B demonstratives are different words, but they derive from a common historical root, which explains why they look so similar; however, they eventually developed different, albeit closely related, meanings. Yet the defender of a unified semantics might object to all these options: if the lexical entries of type-A and type-B demonstratives were different, we should expect this variation to be encoded differently in other languages. This is to say, there should be languages in which type-A and type-B demonstratives looked so different that the hypothesis that they are morphological variants of the same word would sound wildly implausible.

This is, in fact, the case. Catalan, for example, employs two different sets of words for type-A and type-B demonstratives: "*açò*", "*això*" and "*allò*", corresponding respectively to "this", "that" and "yon", are pronouns and can only be employed on their own, whereas "*aquest*", "*aqueix*" and "*aquell*"[42] only have type-A uses, i.e., they require combination with a nominal (excluding elliptical uses). These two sets of demonstratives are etymologically related, but not plausibly psychologically so. The very same distinction can be found in Occitan. Similarly, the Mulam[43] demonstratives "*ni*" and "*hui*" ("this" and "that") can only be used as pronouns, whereas and "*na:i*" and "*ka*" are always adnominal (Wang & Zheng 1993). There are good reasons, then, for regarding type-A and type-B demonstratives as different words: the meaning of type-A and type-B demonstratives is encoded in very different ways across various languages, some of which even use different stems for each of the two categories (which, of course, renders the hypothesis that they are morphological variants of the same word highly implausible).

The English word "this" can be translated into other languages as two different words, and the appropriateness of one of the translations suffices for ruling out the other one. This suggests that English contains two different "this" (and *mutatis mutandis* for "that"). Consider a parallel case: one of the reasons why we know that English contains two distinct words "bank" is that they translate differently into other languages. The fact that type-A and type-B demonstratives also translate differently provides good reasons for thinking that these two kinds of words are different – perhaps it is right to regard them as homonyms, or perhaps as instances of a single, polysemous word. None of these facts constitute knockdown evidence against the adnominal thesis, but I believe that they do deal a fatal blow to defenders of the pronominal thesis.

These considerations, together with the semantic counterevidence to Lepore and Ludwig's account, suggest that we should seek some alternative approach to the syntax and semantics of complex demonstratives. Let me, however, discuss one final argument in favor

[42] Pretty much like English, most Catalan dialects currently employ a system with just two distance levels for type-A demonstratives: "*aqueix*" is lost in most of the territory and often regarded as an archaism. However, most dialects in the Valencia area maintain the archaic system with three different levels, i.e., they preserve "*aqueix*", although the word is often realized as "*eixe*" in this area.
[43] Mulam is a Daic language spoken by less than 100,000 people in Southern China.

of quantificational approaches to these expressions, and Lepore and Ludwig's in particular. Namely, the very existence of a sentence like (76b) could be employed as evidence that complex demonstratives are, or can be, quantificational. Most philosophers (and a slight minority of linguists) would regard definite descriptions as quantified expressions. The fact that complex demonstratives can be introduced by an overt definite article may show that they are definite descriptions in disguise, and therefore quantified expressions. More generally, this yields plausibility to the ideas by Neale (1993), King (1999, 2001) and other philosophers and linguists who have treated complex demonstratives as a special type of definite description – or who have dealt with both kinds of expressions on a par, much like the early Kaplan (1977), Roberts (2002, 2003) and Elbourne (2005, 2008) did (even if these do not regard definite descriptions as quantificational).

I do not think, however, that the presence of the definite article reveals that complex demonstratives are a special type of definite descriptions, much less that they are quantificational. Namely, the article in (76b) looks like a *dummy determiner*, i.e., one that is added there for syntactic reasons but plays no semantic role. English also contains dummy determiners; for example, the indefinite article accompanying a nominal predicate is usually thought to be semantically vacuous (Heim & Kratzer 1998: 61):

(125a) Kaline is *a* cat

(125b) Kaline is small

The word "small" denotes the set of small things, and the word "cat" denotes the set of cats. If it is possible to predicate smallness of Kaline by means of a simple construction like (125b), then it should be possible to predicate catness by means of an analogous construction, but this results in ungrammaticality:

(125c) #Kaline is cat

These facts suggest that the "a" in (125a) is added only on the basis of syntactic considerations,[44] i.e., it is required by grammar but need not play any role in the semantics.

[44] Some could try to preserve the idea that "a" is not vacuous by arguing that it preserves its original meaning as a quantifier. I.e., it could be argued that (125a) is quantificational and that it means something like "a cat *x* is such that Kaline = *x*". However, there are good reasons for thinking that the "a" is vacuous; namely, the predicates introduced by "a" can be conjoined with predicates with no explicit "a":

(125*) Kaline is small and a cat

In fact, many languages would employ a construction like (125c) instead of (125a). The presence of the definite article in (76b) strikes me as a special case of this phenomenon: a semantically vacuous determiner that is required by syntax. (76a) already contains a determiner, so no dummy is required. The fact that the dummy in (76b) takes the form of a definite probably has to do with the definiteness of the noun phrase. And, indeed, it is not the only use of a dummy definite in Spanish; for example, generic noun phrases, which can be expressed with no explicit determiner in English, require a definite article in that language:

(126a) [OK]Las ballenas son mamíferos

[OK]*The whales are mammals*

(126b) #Ballenas son mamíferos

[OK]*Whales are mammals*

Let me, indeed, discuss one final piece of crosslinguistic evidence, one that I regard as conclusive in showing that the presence of a definite article in (76b) is compatible with the status of the demonstrative as directly referential: the existence of (most probably dummy) definite articles accompanying proper names in many languages. This phenomenon is generalized in meridional dialects of German, ancient Greek, standard Catalan and some varieties of Spanish:

(127a) Der Helga liebt die Elsa

The Helga loves the Elsa

"Helga loves Elsa"

(127b) Ho Sōkratēs aphīketo

The Socrates arrived

"Socrates arrived"

The possibility of conjoining both kinds of predicates is indicative that they are of the same semantic type.

(127c) Demà dinaré amb en Jaume

Tomorrow I will have lunch with the James

"Tomorrow I will have lunch with James"

(127d) La Sofía no ha venido

The Sophie has not come

"Sophie has not come"

These examples show that determiners can appear alongside proper names. Does this show that such proper names are not directly referential expressions? Either the philosophical tradition (Kripke 1972) rests on an important mistake, or the determiners in these examples do not play their usual semantic role. And it seems *prima facie* plausible to assume, as above, that the definite articles in (127a-d) are semantically vacuous but required by syntax – perhaps noun phrases in these languages *always* need an explicit determiner. The lesson to be drawn from these examples is clear: the presence of a definite article in (76b) does not show that the complex demonstrative is a quantifier – it does not even show that it is not a referential term.

So far my discussion of the crosslinguistic evidence and my criticism of Lepore and Ludwig's system. Let us explore some alternative options.

2.3 Donnellan's way: are complex demonstratives ambiguous expressions?

The discussion in the foregoing sections shows that both approaches to complex demonstratives have their own virtues and faults. Directly referential approaches straightforwardly accommodate the more indexical-like behavior of complex demonstratives, but they have trouble with QI-uses, NDNS-readings, Bach-Peters sentences, anaphora and bound variable uses. Quantificational approaches, on the other hand, are more capable of accommodating the latter kind of counterevidence, but as a drawback they are subject to an important number of modal challenges, including objections from attitude reports. These facts may lead some authors to entertain a hypothesis that is similar in spirit to Keith Donnellan's (1966) proposal for understanding definite descriptions: namely, that it

is helpless to seek a unified semantics for complex demonstratives, for they display both *referential* and *attributive* uses.

In a more semantically-oriented fashion, we may put this thesis thus: there is no single lambda term able to capture all uses complex demonstrative, i.e., these are ambiguous expressions. In addition to their *prima facie* unattractiveness, there are compelling reasons against ambiguity theories in general; for example, Grice's Modified Ockham Razor prescribes not to modify senses without necessity (Grice 1978: 118-119), meaning that, other things being equal, simpler theories are to be preferred, and this includes not multiplying lexical entries unless it is strictly necessary. In addition to this methodological principle, there are further arguments that I have deliberately passed over in the foregoing debate. It is arguably more plausible to construct the referential/attributive distinction in the pragmatics; for example, NDNS-uses could be explained by appealing to Kripke's (1977) distinction between *speaker reference* and *semantic reference*. Speakers may employ sentences containing non-referential terms for conveying singular propositions; for the sake of illustration, a definite description like "the president of the UK" can be used for (implicitly) communicating a singular proposition about Boris Johnson. Similarly, it is possible to regard complex demonstratives as referential terms and yet argue that a sentence like (84) can be employed for conveying a purely general thought. A response in pragmatic terms seems more compelling than one that postulates semantic ambiguity.

Notwithstanding these reasons, ambiguity theories have been suggested, and even defended at length, by several authors, especially those on the referential side. Particularly, the most widely held ambiguity theory is that the semantic counterexamples provided by King (i.e., those I presented in section 2.2.1.2, and more specifically QI-uses) involve "stylistically altered definite descriptions rather than a genuine demonstrative" (Salmon 2002: 522; 2006a: 446; 2006b: 272, footnote 11). This is to say that the "that" in these sentences is actually a different lexical item, an emphatic "the" of sorts. This idea has been endorsed by other defenders of directly referential approaches; compare the following passages:

> "*I am inclined to hear 'that' in these constructions* [QI-uses] *as having a distinct sense from the normal demonstrative use (the Oxford English Dictionary singles*

> *out such a distinct use) and as serving rather as an emphatic form of definite description.* [...] *I will, therefore, assume that such examples make use of another word, homophonous with the demonstrative "that", and treat them as outside the scope of my investigation.*" (Dever 2001: 286)
>
> "*Sentences like these* [QI-uses]*, however, are rather awkward and may be viewed more accurately as idiomatic uses of language. When binding is allowed* [...] *the bound complex demonstrative may often be interpreted as a definite description. In that case, 'that' can be understood as a different word – as a pragmatic tool that allows one to emphasize the description. It is something like an emphatic use of the determiner 'the'* [...] *My understanding of sentences like these is that they constitute the exception rather than the norm.*" (Corazza 2003: 272).

In fact, the idea that complex demonstratives are ambiguous expressions has been explicitly defended by Geoff Georgi (2012), who captures deictic and non-deictic uses of complex demonstratives by providing two distinct lexical entries. Other authors, while not explicitly endorsing ambiguity hypotheses, have dismissed some of the problematic uses as something that their theory was never meant to account for in the first place (cf. Braun 2008c: 244-246). Arguably, this idea has an important precedent in Kaplan's remarks that pronouns and other indexicals have "homonyms in which I am not interested" (Kaplan 1977: 489).

The dual thesis that I have embraced in the foregoing section is also an ambiguity theory, insofar as it posits two distinct lexical entries, one for pronominal "this" and "that" and another one for their determiner counterparts. Such ambiguity, I have argued, is motivated insofar as these two uses of "this" and "that" translate differently into other languages (either as morphological variants of the same word or, simply, as different words). However, I believe that the very same type of arguments that I put forward against the pronominal and the adnominal theses can be employed for arguing against ambiguity theories in the sense of Braun, Corazza, Dever, Georgi and Salmon. Thus, even though I favor an approach to complex demonstratives in the spirit of these authors (and, more concretely, an account pretty much like the ones developed by Braun and Salmon, as well as Borg), I differ from these authors in an important respect: I believe that the counterevidence is too systematic, and too crosslinguistically well-supported, to be put aside as a case of ambiguity. Let us see why.

The discussion here follows, essentially, Nowak (2014), although I will also make use of King's (2001) arguments against ambiguity approaches. In the first place, QI uses of complex demonstratives are widespread and common in many languages besides English. The examples Nowak provides come from Russian and Italian:[45]

(128) [Kazhdy]$_1$ poshël k **tomu** metro kotoroe k nemu$_1$ bylo blyže vsego

*[Each (person)]$_1$ went to **that** subway station that was closest to him$_1$*

(129) [Ogni padre]$_1$ ricorda con nostalgia **quel** periodo della sua$_1$ vita in cui [*pro*$_1$] non aveva ancora la responsabilità dei figli

*[Every father]$_1$ remembers with nostalgia **that** period of his$_1$ life in which he$_1$ did not have yet the responsibility of his children*

If complex demonstratives were ambiguous expressions, then other languages should lexicalize QI-uses differently, i.e., the fact that the very same word is used in deictic and QI-uses should be an idiosyncrasy of English. But, as the above examples show, the very same phenomenon is attested across many languages. In fact, as far as I can tell every Romance language displays QI-uses. This evidence makes a strong case against ambiguity theories: if English contains two distinct words "that", pretty much like it contains two distinct "bank", how come that these words do not translate differently into other languages? This, Nowak argues, shows, *contra* the above authors (and *pace* the Oxford English Dictionary), that English does not contain two different determiners realized as "that" – although, as I explain below in footnote 87, English complex demonstratives do display a certain idiosyncrasy that Nowak does not consider, one that, in fact, constitutes good evidence for both the theory I defend here and the one he himself presents (Nowak 2019a; see section 3.3.1.3).

Another source of evidence against ambiguity theories, and more concretely against Salmon's idea that QI-uses involve a stylistic variant of "the", comes from substitution tests carried out in English. If "that" could work as a stylistic variant of "the", we should be able

[45] In the Italian example, "pro" (pronounced "little pro" or "baby pro", as opposed to big PRO) stands for the elided subject of the relative clause ("he" in the English translation). English lacks "pro", which usually only appears in languages displaying a rich verbal morphology agreement system, such as Italian. See Carnie (2013, §15).

to substitute one word for the other *salva veritate* and *salva felicitate* in all linguistic contexts. But this idea does not cope well with the following contrast (Wolter 2006; Nowak 2014, 2019a; see also King 2001, §5):

(130a) *That author of *Waverley* also wrote *Ivanhoe*

(130b) ^{OK}The author of *Waverley* also wrote *Ivanhoe*

Sentence (130a), while not ungrammatical, does not sound felicitous, or at least not as good as (130b). But the "stylistic variant"-theorist predicts that it should be possible to use them interchangeably. Further examples include the contrast between the self-contradictory (131a) and the perfectly felicitous (131b), and that between (83)-(83a) (Roberts 2002, 2003):

(131a) The bottle is on the table but the bottle is not on the table

(131b) That bottle is on the table but that bottle is not on the table

(83) [A student]$_1$ was sitting in the library. [Another student]$_2$ was sitting across from her$_1$. [That student]$_2$ had a logic book

(83a) [A student]$_1$ was sitting in the library. [Another student]$_2$ was sitting across from her$_1$. [The student]$_2$ had a logic book

Sentence (131a) is self-contradictory because it presupposes or asserts that a unique bottle is contextually available; by contrast, (131b) shows that things are different with complex demonstratives, which never (or rarely) trigger that kind of presupposition (although Roberts (2002, 2003) has argued that they actually do; her account is briefly discussed in the next subsection). The very same fact can be illustrated by means of (83)-(83a): in the latter there is more than one student available, and for this reason it is not appropriate to use a definite description; by contrast, the one with the demonstrative is perfectly fine.[46] These

[46] The self-contradictory nature of this sentence requires several – on the other hand not too controversial – assumptions, such as the idea that the domain of quantification does not change in the middle of the utterance in (131b), as required by the standard Kaplan-inspired understanding of contexts (Kaplan 1977, 1989; see the discussion in 2.2.1.3). Another mechanism that could turn this sentence into a non-contradictory one is the idea that quantifiers include variables at some level of representation, either contributed by the determiner (von Fintel 1994) or by the noun (Stanley & Szabó 2000). But, even if we were willing to concede one of these things (see Cappelen & Lepore 2005a, 2005b for severe criticism on similar ideas), there is still an important contrast between (131a-b): namely, a non-contradictory reading of (131b) still requires that a context-change takes place or that the two definite descriptions be assigned different domains of quantification, whereas there is no such requirement for the appropriateness of (131a). All that it requires in order not to sound contradictory is a very reasonable assumption: that contexts may contain more than one demonstrated object.

examples seem to undermine the possibility that complex demonstratives can work as stylistically altered definite descriptions. And, on the other hand, the very same contrast is also attested crosslinguistically. Of course, as Nowak (2014, 2019a) acknowledges, these facts are also problematic for other proposals that treat complex demonstratives as a special type of definite description, such as Kaplan's (1977) first "dthat" and the theories by Neale (1993), King (1999, 2001) and Elbourne (2008). I will come back to the contrast between complex demonstratives and definite descriptions in section 3.3.1.3.

There is, however, another possible way to understand the proposal that complex demonstratives may sometimes function as stylistically altered definite descriptions: it may be understood as a pragmatic proposal. An argument found in Braun (2008a), and also tentatively suggested by Nowak (2014) as a possible reading of Salmon's suggestion, goes like this: the truth-conditions predicted by directly referential theories for QI-uses are, in fact, right, but they are so unlikely to hold, and therefore so counterintuitive, that speakers have a tendency to systematically infer a different meaning, namely the kind of meaning usually associated with definite descriptions. Recall the truth-conditions of (77), repeated below:

(77) Every queen cherishes that cleric who crowned her

The standard advocate of direct reference predicts that this sentence is true iff the demonstratum d_c of the context is cherished by every queen, under the presupposition that d_c crowned them all. These truth-conditions are so unlikely that any kind of Gricean reasoning should lead to the conclusion that the utterer of (77) intended to convey something very different, plausibly the very same content that she would have literally asserted had she employed "the" instead of "that". In fact, as Braun (2008a) notes, QI-uses are sometimes noted by speakers to sound sort of awkward, and the pragmatic hypothesis has a tentative explanation for this oddness:

> "*Some speakers encounter QI sentences more often than others, and some speakers are more sensitive to literal content than others. Those who have encountered fewer QI-uses, or who are more sensitive to literal content, may judge (77) to be odd. They may realize that a speaker is unlikely to demonstrate a particular cleric while uttering (77), and also realize that in the absence of a demonstrated cleric, (77) cannot be true. They may feel an urge to substitute 'the'*

> *for 'that'. Those who have encountered more uses of QI sentences to communicate descriptive propositions, or who are less sensitive to literal content than the preceding speakers, may find (77) fine."* (Braun 2008a: 85; I altered the text in order to fit the examples)

For these reasons, the pragmatic hypothesis strikes me as more plausible than the appeals to semantic ambiguity. The argument may be understood in parallelism to Kripke's (1977) response to Donnellan (1966): the fact that speakers may use definite descriptions for conveying singular thoughts does not entail that the truth-conditions of a sentence containing a definite description may sometimes be those of a singular proposition. Similarly, it should be possible to use a directly referential term for implicitly conveying descriptive propositions. And the latter may in fact be inferred on the basis that the singular proposition literally expressed by the utterance is highly unlikely to hold. On some occasions, however, this proposition is perfectly available; consider the following example by Lepore and Ludwig (2000):

(132) [Every woman]$_1$ in this room admires that man she$_1$ sees at the podium

Imagine that there is only one man at the relevant podium, i.e., all the women in the room are seeing the very same man. In that case, the truth-conditions predicted by advocates of direct reference (and those predicted by Lepore and Ludwig's theory) are straightforwardly right: it is true iff a certain man, d_c, is admired by every woman in the room, under the presupposition that he is seen at the podium by all of them (in Lepore and Ludwig's system, it is true iff the x such that x is a man seen by every woman and $x = d_c$ is admired by every woman). These truth-conditions, however, are only appropriate in a very limited set of occasions, which explains that the use of QI sentences will normally result in the participants of a conversation engaging in Gricean reasoning that will lead them to infer a very different content.

But, as Nowak (2014) notes, this response is unconvincing for the same reasons as the theory that postulates semantic ambiguity. If an error theory along those lines were right – i.e., if participants in a conversation were systematically mistaken about the truth conditions of sentences like (77) but were nevertheless able to employ them for conveying the kind of thoughts normally associated with definite descriptions –, then a sentence like (133a) below should not sound infelicitous, or at least as felicitous as (133b):

(133a) *Scott was that author of Waverley

(133b) [OK]Scott was the author of Waverley

Similar remarks could be stated concerning pairs like (130a-b), (131a-b) and (83a-b). Unlike Nowak, I do not think these data fatally undermine pragmatic accounts of the non-deictic readings of complex demonstratives, but I do think that they provide good reasons to try to seek the right answer elsewhere.

This is not the end of the story, however. The pragmatic approach could be implemented differently: instead of saying that sentences containing complex demonstratives may be used for conveying thoughts that would normally be expressed by sentences whose semantics needs not incorporate any directly referential term, one could try to construct the referential-attributive distinction somewhere else. For example, Corazza (2003), Elbourne (2008) and Georgi (2012) embrace the idea that the referent of complex demonstratives – and indexicals in general – may sometimes be determined through what Quine (1969: 194) labeled "deferred ostension", i.e., through an ostensive gesture towards an object that is different from, but suitably related to, the object that ultimately serves as the referent of the term. A typical example for illustrating this phenomenon is the following: I may point at a book and utter "That's my favorite author" (see Borg 2002 for extensive discussion on the notion).

The phenomenon of deferred ostension was largely explored by Geoffrey Nunberg (1993), on whose system the above-mentioned authors build. Once we embrace the idea that the semantic value of an indexical can be obtained in this indirect way, we do not even have the need to say that this value is an individual: the object selected by the demonstrative might as well be a property, such as *being the student who scored one hundred*. And attributive uses could arise whenever the selected value is some individuating property – this is roughly the proposal put forward by the aforementioned authors for dealing with NDNS-uses. Whatever one may think about the Nunberg-style machinery for deferred ostension, these approaches show, at the very least, that referential theories have not yet exhausted their resources.

On the other hand, directly referential theories do get a lot of things right, as the data in section 2.1 show. For this reason, I believe that it is worth trying to develop a version of

these theories able to deal with the problematic data. However, as the discussion in this section made clear, I do not think that these counterexamples can be put aside as cases of ambiguity, and explanations in pragmatic terms are likely to encounter an important amount of problems. This leads me to the main aim of this dissertation: I intend to vindicate a version of c-theories able to handle all problematic counterexamples in semantic terms. This is what I set out to do in section 3.

3 Complex demonstratives as singular terms

In section 2 I have argued that, in spite of the several problems they are faced with, directly referential theories have a good deal of virtues. They straightforwardly accommodate the facts about ellipsis, anaphora and opacity to modal and temporal quantification and, additionally, c-theories are also able to explain the data about analyticity and entailment. In this respect they have proved much superior to quantificational theories, which need to go through a lot of trouble – and more than a few *ad hoc* principles – in order to accommodate the very same data. On the other hand, we have good reasons for thinking that the syntactic evidence alluded to in favor of quantificational theories is, at most, inconclusive. Thus, the only obstacle directly referential theories are left with is the semantic counterevidence from 2.2.1.2. The complications with QI-uses look particularly troubling, for they are unlikely to be explained away by appealing to pragmatic principles.

The current section is the core of this dissertation, for my aim here is to tackle all the problematic data. In particular, I intend to show that c-theories are able to accommodate all the counterexamples that King and others have posed to them, as long as they are willing to make a couple of adjustments, in turn required by independently motivated and fairly standard assumptions. More exactly, there are three background assumptions that we need to acknowledge: a) that natural language contains operators on character (Kaplan's (1977) monsters), b) that natural language has the expressive power of full object-language quantification over times and worlds (Cresswell 1990) and c) that there is a well-defined subset of anaphoric relations that do not fit the standard bound variable paradigm and require special treatment. Let me appropriate Gareth Evans's (1977a, 1977b) label "E-type anaphora" for referring to anaphoric relations of the latter kind, although this use should not be understood as an endorsement of Evans's positive proposal, but rather as just a general label encompassing the broad phenomenon of *co-variation without c-commanding*, which includes the so-called "donkey anaphora" (Geach 1962) and "discourse anaphora" (see King

& Lewis (2018), particularly section 2, for an overview of these two phenomena[47]). I shall argue for each of these three points in sections 3.3.2.1, 3.3.1.2 and 3.3.4, respectively.

Acknowledging these facts requires implementing several changes into one's semantic system; for example, embracing monsters requires the adoption of a combination rule like HFA above, and the facts about natural language expressivity recommend enriching the syntax of the object language with explicit world and time variables. I intend to show that these modifications are all that the classical theories need in order to accommodate the problematic counterevidence from section 2.2.1.2. In particular, any c-theorist willing to implement these adjustments into her theory will find herself in position to regard the troubling examples as special cases of more general phenomena: each of the problematic cases can be reduced to either a case of E-type anaphora, an instance of monstrous quantification over character, or a combination of both. And, importantly, monsters and E-type anaphora generate non-deictic (i.e., non-referential) uses of *any* indexical, not just complex demonstratives. In other words, the c-theorist is in a position to explain the non-deictic readings of complex demonstratives by means of the very same mechanisms that account for the non-deictic readings of any other indexical. Thus, one of the main tenets of c-theories, namely that the semantics of complex demonstratives is pretty much like that of pronouns like "he" or "she", can be vindicated (see in particular Braun 2008c: 244-246 for an explicit endorsement of this claim).

There are yet two more tenets of c-theories that I would like to argue for: that complex demonstratives are singular terms, and that the semantic contribution of the nominal takes place at the level of character, not content. The former will turn out indispensable for accounting for the data about anaphora and ellipsis, whereas the latter, as we have already seen, explains the data about opacity. I nevertheless depart from standard c-theories in an important respect. As the discussion in 2.1.2 made clear, c-theorists think of contexts as privileging a *demonstratum* parameter. For this reason, they are unable to get rid of rigidity, a fact that proves fatal when it comes to QI-uses. But, as we shall see right in the next sub-section, we have good reasons for thinking that this idea should be rejected. Before stating my own version of c-theories, let me discuss a problem that is common to most of the above-

[47] King and Lewis coin the term "problematic anaphora" for referring to what I have called "E-type anaphora". In view of the massive amount of literature on the topic, their terminology is indeed quite fitting.

mentioned theories, either quantificational or directly referential: the idea that a lexical entry for complex demonstratives should include instructions for selecting a *demonstratum*. This idea has been deemed responsible for several wrong predictions about entailment and logical validity (Predelli 2012b, 2013) and, in addition, it has been regarded as psychologically unrealistic (Nowak 2019b). I find myself in full agreement with these claims, so let me expand on them just in order to see what an appropriate lexical entry for complex demonstratives should look like.

3.1 Some problems common to most theories of complex demonstratives

In this section I will review the arguments that have been put forward against certain kind of requirements that some lexical entries impose on complex demonstratives. These criticisms are often formulated against the lexical entry typical of c-theories, although, as we shall see, they can be posed against approaches of any kind. Recall the generic lexical entry that we stated above for c-theories:

(27) For any context *c*, "that F" refers in *c* to an object α iff:

i) α is the demonstratum of *c* and

ii) α satisfies F in w_c and t_c

This lexical entry is not problematic as it stands, but some authors have introduced further constraints. I am particularly concerned with the restrictions that have been established for condition (27i) to obtain, i.e., for an object α to count as a demonstratum. For example, Braun (1996) requires that the demonstratum be the object selected by a demonstration taking place in the circumstance of the context, Borg (2000) includes into her lexical entry the idea that the object selected by a complex demonstrative should be demonstrated by the speaker, and Salmon (2002) imposes a similar requirement to the effect that, for each context *c*, the referent of a complex demonstrative as interpreted in *c* is the unique demonstrated target in w_c. Thus, these authors impose constraints on what can count as a demonstratum. This kind of requirements are not exclusive from c-theories, however. Lepore and Ludwig (2000: 232) constrain their lexical entry in a very similar manner:

(134) For all speakers *s*, times *t*, speech acts *u*, and objects *x*, if *s* demonstrates *x* at *t* using "that" in *u*, then the referent of "that" as used by *s* at $t = x$

The idea that whatever is picked out in a context must be demonstrated by the speaker at the world of the context is an old one. Donald Davidson (1967: 319-320) tentatively suggests the following lexical as a promising starting point for the semantics of complex demonstratives:

(135) "That book was stolen" is true as (potentially) spoken by *p* at *t* iff the book demonstrated by *p* at *t* is stolen prior to *t*

All these ideas are probably fine when it comes to developing a theory of language use,[48] but, if we are talking about meaning proper, two problems arise: they yield wrong predictions when it comes to basic phenomena that every semantic theory should be able to model correctly, such as analyticity and entailment (Predelli 2012b, 2013), and the conditions they impose on grasping the meaning of a word are psychologically unrealistic, for they are redundant (Nowak 2019b). In the next two subsections I will review the main reasons we have for rejecting the incorporation of this kind of conditions into the lexical entry of demonstratives (and any word in general). However, I shall go one step further, for my aim is not just to argue that c-theorists should get rid of these constraints imposed on condition (27i); rather, the version of c-theories I will ultimately end up defending will lead me to the rejection of condition (27i) altogether. Thus, the following discussion may be seen as an inquiry into how a proper lexical entry should look like.

3.1.1 Truth in virtue of character

The first argument I wish to consider is the criticism put forward by Predelli (2012b, 2013) against the idea that the demonstrata of a context should satisfy requirements like those mentioned above, such as being demonstrated by the speaker.[49] Predelli shows that conditions of this kind, paired with a Kaplanian understanding of logical truth, end up

[48] Lexical entries like (134)-(135) suggest that the primary bearers of truth-conditions are not sentences but speech acts. In fact, Davidson acknowledges the influence of John Langshaw Austin (1950) in this treatment of demonstratives.

[49] Predelli (2001) presents yet another argument against c-theories concerning anaphora. I discuss and reject it in section 3.4.2.

validating inferences that shouldn't be licensed. In other words, it overgenerates when it comes to validity (analyticity) and logical consequence (entailment). Let us see why. For simplicity's sake, I will formulate the critique in terms of bare demonstratives, but these arguments straightforwardly apply to the complex ones. As above, assume that a sentence *p* is logically valid iff it is true in all contexts, where being true in a context means being true when interpreted in the pair $<c, i_c>$. Similarly, *p* is a consequence of *q* iff it the former is true in every context in which the latter is.

The argument may be formulated in a very simple way if we assume that contexts are composed of the usual parameters plus a demonstrative, as in the toy version of c-theories I presented above in section 2.1.2, but let me slightly alter the composition of contexts in order to fit Braun (1996) and Salmon's (2002) lengthy arguments to the effect that demonstrata should not be included as part of the context. Although Braun's contexts do include a demonstratum parameter in the essays where he presents his version of c-theories (Braun 1994, 2008a), his official position is one in which the extension of a sentence containing a demonstrative is relative to three parameters: a context *c*, a circumstance *i* and a demonstration *d*. Predelli (2012a: 550) renders his lexical entry thus:

(136) $[\![\text{that}]\!]^{d, c, i}$ = the unique *x* demonstrated by *d* in i_c

Notice one thing: insofar as character is conceived as a function from contexts to contents, Braun's "that", by itself, *lacks a character*. It is the combination of a demonstration plus "that" that yields a character, which, together with a context, can return a content. Instead, what "that" is endowed with is a demonstration-invariant meaning; more accurately,

(136a) $[\![\text{that}]\!] = \lambda d.\ \lambda c.\ \lambda i.$ the unique *x* demonstrated by *d* in i_c

This demonstration-invariant meaning combines with a demonstration in order to return a context-invariant meaning or character. For some demonstration *e* (say, my pointing towards the bottle in front of me), the character of "that" under *e* may be rendered thus:

(136b) $[\![\text{that}]\!]^e = \lambda c.\ \lambda i.$ the unique *x* demonstrated by *e* in i_c

Finally, this character returns a content once a context is supplied. For these reasons, Braun calls his approach the "Three Meaning Theory". Salmon's theory is very similar, for

he also relativizes the semantic value of "that" to a demonstration, but, unlike Braun's, his "that" does have a character, since demonstrations d are part of the context:

(137) $[\![\text{that}]\!]^{c, i}$ = the unique *x* demonstrated by d_c in i_c

Of course, these two theories are just terminological variants of each other. For each of Braun's combinations of a context *c* and a demonstration *d*, Salmon's theory contains a context $k = \langle a_c, w_c, t_c, d\rangle$; on the other hand, for each of the contexts $q = \langle a_q, w_q, t_q, d_q\rangle$ in Salmon's theory, Braun's contains a combination $\langle d, k\rangle$ such that $k = \langle a_q, w_q, t_q\rangle$ and $d = d_q$. And, of course, for each context *c* and demonstration *d* in Braun's theory, $[\![\text{that}]\!]^{d, c}$ is identical to Salmon's $[\![\text{that}]\!]^{\langle a_c, w_c, t_c, d\rangle}$ – and *mutatis mutandis* the other way around. Borg (2000: 242), on the other hand, provides a very similar lexical entry, although the semi-technical vocabulary in which she states it does not make it clear whether the demonstration should or should not be part of the context; at any rate she also requires the referent of a complex demonstrative to be demonstrated in the world of the context.[50] For the sake of discussion, let me adopt Salmon's theory as representative of all three approaches, which I shall call "restricted c-theories".

Insofar as demonstrations are assumed to determine a unique demonstratum, one might suspect that restricted c-theories are equivalent to the generic c-theory I presented in section 2.1.2 or, for that matter, Braun's (1994, 2008a) simplified theory – let me dub these "unrestricted c-theories". But they are not equivalent, for the biconditional only holds in one of the two directions. Let d(i) be the demonstratum selected by the demonstration d in circumstance i. Then, for each of the contexts $c = \langle a_c, w_c, t_c, d_c\rangle$ from restricted c-theories, the unrestricted ones contain a corresponding context $k = \langle a_c, w_c, t_c, d_c(i_c)\rangle$, where, of course, the restricted $[\![\text{that}]\!]^c$ = the unrestricted $[\![\text{that}]\!]^k$. The converse, however, is not true. Let $\langle w_6, t_4\rangle$ be a circumstance where no demonstration ever occurs. In principle, unrestricted theories allow there to be a context like, say, $q = \langle$Marcus, w_6, t_7, Kripke$\rangle$, where Marcus and Kripke are, respectively, the agent and the demonstratum of *q*. But, given that $\langle w_6, t_7\rangle$ is a circumstance where nothing is demonstrated, there is no demonstration d in restricted theories such that $d(\langle w_6, t_7\rangle)$ = Kripke. In more general terms, for any demonstration *d*, the

[50] In a later essay, Borg (2002) employs (and explicitly argues for) a technical notion of demonstration that suggests that perhaps her theory belongs to what I am calling "unrestricted c-theories". See below.

unrestricted $[\![\text{that}]\!]^q \neq$ the restricted $[\![\text{that}]\!]^{<\text{Marcus}, w_6, t_7, d>}$, for former picks out Kripke, whereas the latter is, simply, uninterpretable – it selects nothing. That means that the theory as I presented it in 2.1.2 and Braun's simplified theory allow more contexts than Borg's, Salmon's or Braun's official theory.[51] Predelli's (2012a, 2013) criticism of (restricted) c-theories concerns, precisely, the lack of such contexts.

The main problem with disallowing the existence of contexts of that kind is, simply, that these theories end up overgenerating when it comes to logical truth. Let us see why. The above requirement that the content of "that" in a context should be the object selected by the demonstration in the relevant circumstance may be put thus (again, I shall put this in terms of Salmon's theory, but it can be easily adapted to Braun's or Borg's):

(138) For all *x*, $[\![\text{that}]\!]^c = x$ iff $[\![\text{demonstrate}]\!]^c (i_c, d_c, x) = 1$,

where "demonstrate" is a three-place predicate between circumstances, demonstrations and their associated demonstrata that yields truth just in case the former picks out the latter in the selected circumstance. This means that the character of "that", in restricted c-theories, is given by a proper subfunction of the character of "that" in the unrestricted ones. Namely, the former kind of theories only include contexts satisfying condition (138), which are a proper subset of the ones allowed by theories of the latter kind (hence the appropriateness of calling them "restricted" and "unrestricted", respectively). And, because of this, restricted c-theories end up validating truths like the following:

(139) If that is green, then something is being demonstrated

Let *c* be a context in which the premise is true (i.e., true when assessed in the pair $<c, i_c>$). If so, the premise is interpretable, and therefore $[\![\text{demonstrate}]\!]^c (i_c, d_c, [\![\text{that}]\!]^c) = 1$. This, in turn, entails that i_c contains an object that is being demonstrated (i.e., there is some object *x* and a demonstration *y* such that $[\![\text{demonstrate}]\!]^c (i_c, y, x) = 1$). This makes the conclusion true in $<c, i_c>$. Of course, this point generalizes: for example, "demonstrations exist" turns

[51] The non-equivalence, of course, does not only affect contexts without demonstrations. Let $<w_8, t_2>$ be a circumstance in which only one demonstration occurs, one that, in fact, picks out Anscombe. Then unrestricted theories allow there to be two contexts like <Geach, w_8, t_2, Anscombe> and <Geach, w_8, t_2, Hypatia>, whereas a context like the latter is ruled out by the restricted ones.

out to be a consequence of "that is blue" on every theory abiding by a principle like (138). This is of course wrong.

Predelli's diagnosis is clear: the existence of demonstrations or demonstrating gestures should be left out of the truth-conditional contribution of a demonstrative. This applies not just to c-theories, of course. For example, Kaplan's suggestion that "dthat (the demonstrated object)" may be regarded as the formal counterpart of "that" also yields undesirable results, for it also validates (139). Arguably, (134)-(135) are wrong for the very same reasons, although perhaps these authors would simply dismiss the criticism, for they present their lexical entries as something belonging to a theory of speech acts, and they are therefore not primarily concerned with properties of sentence-types such as analyticity and entailment. Be it as it may, our theory should, for the sake of logical accuracy, include contexts that Borg, Braun and Salmon would probably regard as improper.

Let us now examine a possible criticism towards Predelli's argument. One might argue thus: isn't this reasoning mixing things up? After all, it presupposes that some technical terms from the metalanguage, such as "demonstration", "demonstrate" and "demonstratum", are equivalent to their object-language counterparts. I.e., perhaps (138) is just mistaken: maybe the property "being demonstrated", which we attribute to many things in the metalanguage (cf. (136a-c) and (137)), is not obtained by means of disquotation; in more formal terms, perhaps $[\![\text{demonstrate}]\!]^c \neq \lambda i.\ \lambda x.\ \lambda y.$ x demonstrates y in i. After all, there is no need for our lexical entries to be Davidsonian.[52] The notion of demonstration is a technical one, one that need not correspond to any sort of pointing, intention, gesture and the like. In other words, it is something ordinary speakers need not have access to, and that therefore need not correspond to any word in their language, not even the word "demonstrate". This wider notion of demonstration is found, for example, in Borg (2002: 508), whose discussion seems to suggest that she would reject (138). This means that c-theorists may formulate their restriction on contexts in some other way: they can simply assume that demonstrations are functions from contexts to objects, one that need not abide by condition (138). In other words, they can allow improper contexts in their theory without thereby overgenerating logical truth.

[52] See Glanzberg (2014), and especially Yalcin (2018), for a thorough critique of Davidsonian theories, and in particular of the idea that words in the object language should be translated as homonyms in the metalanguage.

If this is so, however, I do not see any reason these authors could have for adopting a theory on which the demonstratum is not incorporated directly into the context but obtained in an indirect way through a demonstration. Any theory willing to give up on condition (138) can avoid the overgeneration problem as much as the unrestricted theory does; it is therefore natural to assume, simply, that what contexts contain is not a demonstration but a demonstratum that serves as the value for the character of demonstratives. How this demonstratum is in fact selected is something that need not be encoded in the meaning of "that" – it is something extrasemantic, something that belongs to pragmatics, or perhaps to the theory of perception or general psychology (a point endorsed by Borg 2002). Be it as it may, the only semantic role of "that" should be to select an object from the context.[53]

Let me now come back to complex demonstratives, for they raise further issues. Recall that, according to standard c-theories, whatever is picked out by a complex demonstrative of the form "that F" in a context *c* should satisfy two requirements: it should be the demonstratum of the context, and it should satisfy the descriptive meaning "F" of the demonstrative. But, arguably, these two requirements are not on a par. As we have already seen, any requirement we want to impose on demonstrata should be left out of the truth-conditional profile of the demonstrative, i.e., it should be "*extra-linguistic and thus off-the-record*", to use Kaplan's (1989: 572) phrase. But the descriptive meaning contributed by the nominal is a bit different; recall (28) and (29):

(28) That spy is a spy

(29) a. All dentists are paid more than all doctors

b. Therefore, that dentist is payed more than all doctors

[53] This way of conceiving character is not uncontroversial. Georgi (2019) argues that this conception of character threatens to trivialize semantic theory: if no significant restrictions are imposed as to what is required in order to count as an agent, an addressee or a demonstratum, then the theory fails in providing a way of distinguishing the meaning of any two indexicals, for they all are assigned exactly the same role, namely to pick out a parameter from the context. To be sure, "I", "you" and "that" are devised, respectively, to pick out agents, addressees and demonstrata, but the problem is that, on this conception of character, these labels are empty, devoid of any significant content. We could exchange the characters of "I" and "you" and the theory would still make exactly the same predictions. A similar point was put forward by Derek Ball (2017): this way of conceiving character, in which it has nothing to say about why expressions receive this or that content in this or that context, renders semantic theory explanatorily incomplete.

(28) is analytic and (29) strikes us as a valid inference. These examples show that there is a disanalogy between the descriptive meaning contributed by the nominal and whatever requirements we may want to impose on what counts as a demonstratum, for the former, unlike the latter, does have a semantic role to play (although see footnote 11). What the above examples show is that the descriptive meaning of the nominal part of a demonstrative does seem able to impose restrictions on interpretability: it is right to prevent the character of "that dentist" from taking a value in contexts in which the demonstratum is not a dentist, but it is illegitimate to restrict contexts in the same manner on the basis of principles like (138). Any theory treating these two kinds of restrictions on a par will either overgenerate or undergenerate when it comes to logical validity. The problem of restricted c-theories is precisely this: they treat both requirements on a par. But, arguably, they should not.

This kind of criticisms are not exclusive for c-theories, and in fact they can be posed for theories not primarily concerned with validity and entailment. Let me consider one such theory: the dynamic approach by Craige Roberts (2002, 2003). The framework she works with is a version of Stalnaker's (1978) context-change semantics, in which the meaning of a sentence lies in its potential to change the *common ground*, i.e., the set of assumptions shared by the participants in the conversation. In this kind of frameworks, the common ground is usually modeled as a set of possible worlds, and asserting consists in eliminating worlds from this context, namely those incompatible with the content of the assertion – so far this is rather well-known. Roberts's theory in particular is meant as an improvement of the framework by Irene Heim (1982), in which the common ground is not understood as a set of worlds, but rather as a set of pairs consisting of an assignment and a world. The idea that both Heim and Roberts assume is that noun phrases contribute what they call "*discourse referents*", which are modeled as (numerical) variables with associated presuppositions. Consider, for the sake of illustration, the following fragment of discourse:

(140) [The king of France]$_1$ entered the room. He$_1$ was carrying a pie.

How does this sentence contribute to eliminating material from the common ground? As stated above, noun phrases contribute variables with associated presuppositions – let me remain neutral about what (140) presupposes, for Heim and Roberts differ. Presuppositions aside, this discourse is true in exactly those pairs <g, w> of an assignment function and a

world such that g(1) enters the room in w and g(1) carries a pie in w. Or, in other words, (140) eliminates from the common ground those pairs <g, w> in which g(1) does not enter the room carrying a pie in w. Just as in any other Stalnaker-style framework, the semantic contribution made by asserting a sentence may vary depending on the common ground – say, if our shared assumptions agree in that the current king of France is Donald Trump, then (140) will eliminate those pairs in which g(1) ≠ Donald Trump, as well as those in which Trump does not enter the room carrying a pie. Indefinite noun phrases make similar contributions:

(141) [A woman]$_2$ entered the stage. She$_2$ was carrying a basket

As above, this fragment eliminates from the common ground those pairs <g, w> such that g(2) does not enter the stage carrying a basket. Of course, the indefinite "a woman" carries a different kind of presuppositional information – namely, that of not having been previously introduced in the discourse –, which explains the difference with (140).

Roberts's theory, in particular, is concerned with offering a unified treatment for all definite noun phrases, including pronouns, complex demonstratives, definite descriptions and indexicals, among others. Namely, she argues that what makes them definite is that they trigger (at least) two presuppositions: one of *familiarity* and one of *uniqueness*. The former presupposition is satisfied by belonging to the set of familiar referents (i.e., those already introduced or those whose existence is implied by the context). Let us call this set "Dom", and let it consist of variables. The idea that a definite presupposes familiarity amounts to saying its associated numerical variable should already belong to Dom at the time of utterance – or that it might be made salient by the utterance itself. Of course, this need not be the case of indefinites: my use of "a chair" does not presuppose familiarity with any chair. Additionally, definites also trigger a uniqueness presupposition; for example, a definite description like "[The king of France]$_1$" presupposes a content that can be modeled as the set of pairs <g, w> such that, for any $n \in$ Dom, if g(n) has the property of being a king of France in w, then g(1) = g(n).

Pronouns are also definites on Roberts's theory, which means that they also trigger uniqueness and familiarity presuppositions. One might wonder how uniqueness can ever be

satisfied in the case of sentences containing two pronouns with the same descriptive content, like "he is taller than him", but Roberts claims that this can be achieved by requiring pronouns satisfy an extra presupposition. She claims that Dom contains a subset of partially ordered *salient* discourse referents. And pronouns pick out the *unique* most salient entity satisfying the descriptive content of the pronoun (say, being a female in case of "she"). Let us see an example:

> (141a) A woman entered from the left of the stage. Another woman entered from the right. She was carrying a basket.

Exophoric uses aside, the pronoun "she" in this example is, by default, interpreted as referring to the second woman. A reading in which it refers to the first one is very hard to achieve, if available at all, and at any rate infelicitous. Roberts explains this fact thus: pronouns presuppose reference to the most salient entity satisfying their descriptive meaning. The second woman in the discourse was mentioned in the last place, so she is more salient than the first one. Therefore a co-indexing like the one below would result in presupposition failure, for the pronoun would not pick out the most salient female:

> (141a) #[A woman]$_1$ entered from the left of the stage. [Another woman]$_2$ entered from the right. She$_1$ was carrying a basket.

Similarly, a demonstration (say, a pointing gesture) may raise to salience some entities. A use of "he is taller than him" is felicitous only in case the referent of the latter pronoun is somehow ostended, rendering him more salient than the first one. Complex demonstratives (Roberts 2002) are similar: "that table" should refer to the most salient table, and saliency may change midway by means of a demonstration. It also predicts that in a sentence like (83), repeated below, the only NP that can be co-indexed with "that student" is "another student", for the same reasons as the pronoun in (141):

> (83) [A student]$_1$ was sitting in the library. [Another student]$_2$ was sitting by her side. [That student]$_2$ had a logic book.

Since "another student" introduces a discourse referent, this co-indexing ensures that "that student" will always receive the right interpretation: whoever is selected by the variable 2. So far, so good.

Roberts's framework has a lot of virtues and is importantly different from the theories considered so far, but it is subject to a version of the same type of criticisms, for it also incorporates into the lexical meaning of a pronoun the idea that it should select something salient. Her theory is in principle not primarily concerned with philosophical notions such as analyticity and apriority, for it is a dynamic approach conceived rather as a model of the updating of information during a conversation, but it still yields undesirable results: for example, "that is salient" turns out to be always uninformative.[54] In fact, her theory renders sentences like "that table is a table" and "that table is salient" on a par: as long as salience is incorporated into the lexical meaning of a demonstrative, the latter will be as tautological as the former. In her own words, "the sensitivity of pronominal reference to relative salience [...] is more direct, in fact a part of the *conventional meaning* of pronouns" (Roberts 2003: 325, my emphasis). This kind of ideas always end up overgenerating when it comes to analyticity and informativeness.

The moral of the story is clear: no matter which kind theory you advocate, you should never incorporate into the lexical entry of pronouns nor any other word the idea that it should select something salient, demonstrated, intended or ostended in some other manner. Requirements of this kind, while important, are not a matter of semantics, and they will always turn out to be problematic in terms of logical truth and informativeness.

It is of course always possible to cast doubts about the very notions of analyticity and informativeness employed in this section. For example, it could be argued that perhaps the idea that (139) can be an analytic truth, or that it can be noninformative, is not so misguided. A very similar argument was sketched by García-Carpintero (2006: 201-202) against David Chalmer's (2006) criticism of Reichenbachian interpretations of two-dimensional frameworks. Chalmers claimed that this kind of approaches, while perhaps appropriate for modelling the dynamics of a conversation, are nevertheless unfit for capturing the philosophical notion of *apriority*, for they will always end up counting sentences like "language exist" as *a priori* truths. García-Carpintero, who advocates for a token-reflexive framework, responds as follows:

[54] Assuming, as it is rather reasonable to do, that metalinguistic facts are kept fixed. See footnote 14.

> "The concepts of *apriority* and *epistemic possibility* are philosophical, highly theoretical ones. I do not dispute that, after long exposure to philosophical discussions, one can develop the sort of intuitions whose existence Chalmers asserts. The question is what methodological relevance appeal to them has in philosophical discussions such as this. […] Whether or not a philosophically useful concept of apriority will make claims like 'there is thinking going on' *a priori* is up for grabs: it is not the sort of issue to be decided by an appeal to intuition." (García-Carpintero 2006: 202).

Substitute "apriority" for the closely related notions of "analyticity" or "informativeness" and you already have an argument: perhaps the idea that "language exists" or "that is being demonstrated" are analytic truths is not so misguided. Analyticity is a philosophically loaded notion, and, although at first sight the truth of sentences like (139) strikes us as something that cannot be settled only in semantic terms, it is also possible that our best philosophical theory would count them as analytic.

However, these responses just lead us to the next set of problems that can be put forward to the idea that salience, demonstrations and the like should be incorporated into the lexical meaning of demonstrative. The arguments of the next section purport to show that it is psychologically implausible to assume that demonstratives, or words of any kind, should incorporate, as part of their meaning, any instructions for finding a referent.

3.1.2 Redundancy

Good semantic theories deal with meaning-related issues such as analyticity and entailment, as well as phenomena on the interface between syntax and semantics, such as ellipsis, anaphora and compositionality. It is nevertheless possible to take a skeptic stance towards all these issues. Some authors might regard semantic models as too abstracted away from actual speech, and consequently they may find themselves more comfortable with a theory of language use, one that could leave logic aside for the most part, and that therefore would find itself in a much better position to incorporate salience, ostension and the like in the lexical entries of demonstratives. We have seen that a version of Predelli's arguments can be constructed for theories of the latter kind too, for such authors would probably find themselves in trouble when accounting for the informativeness of sentences like "this is

salient" or "that is being demonstrated". But, admittedly, the argument seems to have lost some of its strength in this case, for some authors might be willing to embrace a highly context-dependent notion of informativeness, one that might count these as tautologies in most contexts of utterance. There is nevertheless an additional reason that has been put forward against the idea that the lexical meaning of demonstratives should include instructions for selecting a referent: namely, that such requirements are psychologically redundant.

Ethan Nowak (2019b) has argued that it is unlikely that reference-fixing rules like those in (27i) should belong to the lexical entry of a demonstrative. To this effect he provides three arguments: that this condition is at odds with the standard treatment of pronouns as variables, that it conflicts with the parsimony that is to be expected from any linguistic theory, and that it is superfluous, for the ability to follow instructions of that kind is prior to the acquisition of semantic competence. The former argument is a semantic one, whereas the latter two rely not just on semantics but also on pragmatics and psycholinguistics, and therefore they may be happily employed against incorporating something like condition (27i) even in a theory concerned only about language use. Let us briefly touch on each of these arguments.

Nowak's first argument against (27i) has to do with the desirability of treating demonstratives on a par with personal pronouns. I believe it is flawed, but let me briefly review it anyway, for the arguments mentioned here will be employed later on, in section 3.3.3. Pronouns are usually modeled as variables in semantics (cf. Heim & Kratzer 1998), for they display both free and bound uses:

(142a) She is happy

(142b) Every girl thinks that she is happy

The similarity of "this" and "that" with other pronouns suggests that they should be dealt with in the same terms. But, arguably, variables do not have any kind of lexical meaning incorporating instructions for selecting a referent, so a condition like (27i) precludes a variabilist semantics for demonstratives. Insofar as the functioning of demonstratives is best modelled by employing the usual machinery for variable binding in the case of

demonstratives, instructions for selecting a referent should be excluded from the lexical meaning of these expressions, for variables do not include restrictions of this kind.

A possible response on behalf of advocates of (27i) is that perhaps bound and free variables involve different lexical items, i.e., that (142a-b) involve two different words "she" – this is arguably what Kaplan's (1989) had in mind in his remarks to the effect that bound and free pronouns may be regarded as homonyms.[55] This idea, however, sounds implausible: if sentences (142a-b) contained two different lexical items, we would expect these two words to translate differently into other languages, but they do not (see Rabern 2013, del Prete & Zucchi 2017 and Gimeno-Simó (manuscript) for discussion). Another possible response in favor of (27i), advanced by Nowak himself, may be formulated thus: bare demonstratives resist binding, which is a good reason for thinking that they are not variables after all. If they were so, we would expect the demonstrative in (143b) to display a bound reading pretty much like the pronoun in (143a), but it does not:

(143a) ^{OK}[Every IKEA kit]$_1$ comes with instructions for assembling it$_1$

(143b) #[Every IKEA kit]$_1$ comes with instructions for assembling that$_1$.

If "that" were a variable, it should be possible for the higher quantifier in (143b) to bind it, but it seems that this sentence cannot have such reading. In spite of this, Nowak argues that the fact that "that" resists binding does not preclude a variabilist treatment of demonstratives. In the first place, complex demonstratives do display bound variables uses, as we have seen in section 2.2.1.2. But additionally, the same argument could be used for showing that a pronoun like "it" is not a variable either, for it resists free uses:

(144a) (Gesturing towards an object) Do you see that?

(144b) (Gesturing towards an object) *Do you see it?

Just like (143b), the anomaly of (144b) is due to a missing reading: variables can be either free or bound, but the pronoun in (144b) seems to resist free readings. Does this show that "it" is not a variable? It does not: rather, what the evidence from (143) and (144) suggests is that "it" and "that" are in *complementary distribution*. Two elements of the same linguistic

[55] This could also be the idea behind the distinction between *real* (free) and *apparent* (bound) variables found in *Principia Mathematica* (Whitehead & Russell 1927).

category are in complementary distribution when the environments they can appear in are non-intersecting (in plain English, that each of them can only be used in those occasions in which the other one is not licensed). For example, the English determiners "a" and "an" are in complementary distribution, which can be used as evidence that they are morphological variants of the same word.[56] Nowak tentatively suggests that perhaps the same thing is going on with "it" and "that": they "*might be distinguished as the bound and free versions of the same basic element*" (2019b: 10).

I basically agree with a variabilist semantics for demonstratives, and the suggestion that "it" is in complementary distribution with "that" sounds worth exploring, yet I think the argument does not show what it purports to: the fact that demonstratives are best modeled as variables does not entail that a condition like (27i) cannot be built into the lexical entry of these expressions. Personal pronouns are an example of variables that nevertheless are required to meet similar constraints; for example, Heim and Kratzer (1998: 244) build into the lexical entry of "she" the idea that it should pick out a female:

(145) For any $n \in \mathbb{N}$, $[\![\text{She}_n]\!] = \lambda g$: g(n) is a female. g(n)

I.e., "she" is modeled as a variable whose value depends on the assignment, yet its referent is presupposed to be a female, for it ranges only over assignments whose value for the variable *n* is a female. Incorporating a condition like (27i) into the lexical meaning of "that" should not be any different from a technical point of view. We could have a lexical entry like the following:

(146) For any $n \in \mathbb{N}$, $[\![\text{That}_n]\!] = \lambda g$: g(n) is demonstrated by the speaker. g(n)

This lexical entry treats "that" as a variable whose use presupposes that the speaker is demonstrating the required referent. Of course, binding this variable should not be a problem: the same mechanism employed for bound uses of "she" is suited for binding the variables

[56] Phonetics is perhaps the field in which complementary distribution has been more widely discussed. It is usual, for example, to regard two sounds as allophones (i.e., different ways to articulate the same phoneme) iff they are in complementary distribution. English [p] and [p^h] both correspond to the phoneme /p/, which is pronounced differently depending on the environment; namely, the latter only occurs at the beginning of a word, as in "pig", whereas the former is found in words like "spin", "compliment" or "space".

associated with demonstratives.[57] So the fact that "this" and "that" are better modeled as variables can hardly tell against incorporating (27i) into the meaning of a demonstrative. It strikes me, at most, as a terminological problem.

I find the other two arguments offered by Nowak more compelling. They are closely related, for both of them attempt to show one thing: building something like (27i) into the meaning of a demonstrative is redundant, for the instructions it encodes are something that any reasonable speaker would deploy in trying to find the referent of any term, not just demonstratives. Parsimony demands that these conditions be left out of the character of these terms and to be sought elsewhere – most likely, in the pragmatics. Let us see the first of these arguments.

Assume that the meaning of "that" in English is given by something like (146), i.e., a lexical entry incorporating instructions for selecting a referent. And consider a language, English*, which is just like English except that "that" works as a variable with no associated conditions like (27i): its only role is to select a referent, but the lexical meaning of the term would give us no clue as to which object we should select. Now imagine an utterance of "that is large" in English*. One might wonder what strategy we should carry out in order to determine which proposition has been expressed. Arguably, what we would do is, simply, to try to find the object demonstrated by the speaker, the one she intended to talk about, the one she pointed at, etc. In other words, we would carry out the same procedures that we would have performed had we encountered an utterance of "that is large" in English. This means that both English and English* would require hearers to engage in the very same kind of reasoning. What this entails, of course, is that speakers of English do not need the instructions encoded in (146): they are already capable of arriving at the required proposition. Their pragmatic capabilities would allow them to secure the appropriate referent regardless of whether the instructions for finding it are encoded in the lexical meaning of the word.

Nowak's conclusion is clear: instructions for finding a referent given an occasion of use are already in the pragmatics, so their presence in the semantics of a word is redundant. In fact, this kind of principles are required not just for settling the referent of demonstratives,

[57] An option is to modify FA as Heim & Kratzer (1998: 125) do, and another one is to adopt a mechanism of feature transmission (Heim 2008, von Stechow 2003, 2004) that prevents the presuppositions in these pronouns to be passed on to their bound counterparts. See sections 3.3.3 and 3.3.5.2.

but for any other word; for example, it is reasonable to assume that intentions, demonstrations and ostensive gestures feature prominently in the kind of reasoning we engage in when we are trying to determine whether a token of "bank" is being used for talking about a financial institution, a storing place or the side of a river. Since they are necessary for communication in general, there is no point in building them into the semantics too. Theoretical parsimony suggests that they should be left out of the character of demonstratives.

The second argument is closely related, and it is based on empirical work. Concretely, the data Nowak relies on were obtained by Gillette et al. (1999) in a series of influential experiments on language acquisition. The hypothesis advanced by Gilette et al. was that the reason why children display a relatively impoverished inventory of verbs is not due to their conceptual resources being underdeveloped, but simply because the acquisition of common nouns is helped directly by the extra-linguistic context, whereas verbs (and abstract nouns) require greater support from an already established linguistic background. In order to show this, they asked adults to watch videos of parents speaking to their toddlers. In each of the videos, a word had been replaced for a beep or for a non-sense word, and the task of the participants was to find what the missing word was – to "fill in the blank", so to put it. The results of the experiment showed the blanks that speakers were best at filling in were those associated with concrete nouns, i.e., nouns that refer to a physical object. Thus, one need not hear the word "lion" (and need not decode the semantic information associated with it) in order to know that the topic of the conversation involves lions: that information can be quickly recovered from the context.

This, Gilette et al. argue, suggests that the first step in learning the meaning of nouns – and the first step in acquiring a language – is to try to find out which are the objects around which the conversation revolves. And, arguably, the strategy that the child would adopt for carrying out this task is the same one that (27i) instructs the hearer to deploy: finding what is being demonstrated, what the speaker intends to talk about, what is being pointed at, what is contextually salient, etc. The ability to recognize referents appears to be a basic skill, one that is prior to the acquisition of nouns and one that, in fact, aids the child in the whole process of acquiring a language. Lexicalizing the instructions that need to be followed in order to find a referent is therefore pointless. And, of course, it is so not just from the point of view

of c-theorists, but also from the perspective of authors concerned with language use who just do not see logical accuracy as a relevant constraint on the predictions a semantic theory should make. No matter what you think of semantics, rules for fixing a referent should be part of your pragmatic theory and of your account of language acquisition. This means that no particular expression, not even demonstratives, needs to incorporate such instructions as part of its lexical meaning.

I think the arguments by Predelli and Nowak suffice for rejecting the idea that the lexical entry of a demonstrative should incorporate any sort of reference-fixing rule. These constraints, while important, fall outside the lexicon: they are general skills that therefore deserve a place in the pragmatic domain. Any semantic clause stating them is doomed to be redundant, and, additionally, it will end up overgenerating logical truth. All these arguments point towards an important conclusion: the process of selecting an appropriate demonstratum for a demonstrative is a purely pragmatic one.[58] But, more importantly, they also render (27i) vacuous: if demonstratives encode no substantial constraints for selecting a demonstratum, then rendering their meaning as a function from contexts to demonstrata is something trivial. For this reason, I advocate for a more radical position: I believe we should dispose not just of the constraints on selecting a demonstratum, but also of the idea that each context privileges a demonstratum that serves as the argument for the character of the demonstrative. This is the main modification that I intend to implement into the lexical entry of c-theories. I set out to do it in the next section.

3.2 A new lexical entry

In this section I propose amending the lexical entry of c-theories by dropping condition (27i). The arguments of the previous section have shown that the semantic contribution of this condition is dispensable: if (27i) is unconstrained, it is vacuous, whereas constraining it some way or another is psychologically implausible and, additionally, overgenerates logical truth. In this section I shall go one step further: I argue that this condition is, in fact, one of the

[58] Just to make it clear, I don't mean to say that c-theorists regard the selection of the referent of a demonstrative as a purely semantic process – arguably, they all would acknowledge an important role to general abilities in properly carrying out the task. All I mean is that the constraints imposed into the selection of a referent should play no role whatsoever in the semantics.

main reasons why standard c-theories cannot accommodate the semantic counterevidence from section 2.2.1.2.

Let me remind the reader of the reasons why standard c-theories yield such deviant predictions about the truth-conditions of QI uses of complex demonstratives. Here are the precise and imprecise versions of the generic lexical entries I provided for complex demonstratives:

(27) For every context *c*, "that F" refers in *c* to an object α iff

i) α is the demonstratum of *c* and

ii) α satisfies F in w_c and t_c

(79) ⟦that⟧ = λc: λi. λP: $P(i_c)(d_c) = 1$. d_c (where d_c is the demonstratum of context *c*; do not confuse it with the *demonstration* parameter posited in the former section)

As you may recall, the truth-conditions that (27) and (79) predict for a regular QI-sentence like (77) are highly deviant:

(77) Every queen cherishes that cleric who crowned her

In a random context *c*, the prediction is that (77) expresses the proposition that d_c is cherished by every queen, under the presupposition that d_c crowned them all. These truth-conditions are plainly wrong, and I have already argued that an account in semantic terms is preferable to one that deals with these problems in the pragmatics. But notice that the problem here is, precisely, the idea that each context should privilege a certain individual as its demonstratum. Informally speaking, we want the demonstrative to pick out a different individual for each queen, but this is impossible as long as (27i) is upheld. In other words, this condition is the main responsible for the deviant truth-conditions predicted by standard c-theories. But we have already seen that (27i) is unmotivated. Since we have no reason to preserve it, let me just dispose of it.

Instead, let me conceive the character of complex demonstratives a bit differently. I will be focusing on the problem of QI, for on my view this is the hardest challenge directly referential theorists have to face. Intuitively, what we need in order to solve this problem is that the complex demonstrative not be anchored to a unique individual: in (77), we want it to

select a different cleric for each queen. This amounts to saying that it should select different individuals as long as they satisfy different properties: for each queen *x*, we need the complex demonstrative to select an individual satisfying the property of crowning *x*. This is precisely the view of complex demonstratives I am going to defend here: their semantic role is, simply, to select a certain individual satisfying a certain property. Informally put, a complex demonstrative like "that man" should go to a context *c*, see which individuals satisfy "being a man" in *c*, and select one of them, one that need not coincide with any demonstratum.

Let me, then, make a small amendment to contexts. Instead of demonstrata or demonstrations, each context *c* should contain a function δ_c ranging over properties and returning an individual satisfying that property in the circumstance of the context. In more formal terms, each context *c* should contain a function δ_c: $\Pi \rightarrow E$, where Π is the set of functions of type $<s, <e, t>>>$ and E the set of all individuals (type *e*), such that, for each $P \in \Pi$, $P(i_c)(\delta_c(P)) = 1$. And the role of a complex demonstrative of the form "that F" should be, simply, to select the individual that δ assigns to the property $[\![F]\!]$ in that context.[59] Namely,

(147) $[\![that]\!] = \lambda c.\ \lambda i.\ \lambda P_{<s,\ <e,\ t>>}.\ \delta_c(P)$

This means that the semantic value of, say, "that man" in context *k* is as singular as it can be, i.e., simply an individual, $\delta_k([\![man]\!]^k)$, with the additional requirement that $\delta_k([\![man]\!]^k)$ be a man in circumstance i_k. Let *q* be a context such that $\delta_q([\![man]\!]^q)$ = Boris Johnson. In that case, the content expressed by "that man is bald" in *q* is given by (148a) (or by its structured counterpart in (148b)):

(148a) $\lambda i.$ Boris Johnson is bald in i

(148b) <Boris Johnson, being bald>

Of course, these propositions can only be expressed in contexts in which Boris Johnson is a man; thus, this theory meets the desideratum that the nominal should play a semantic role. But, importantly, this role is restricted to the level of character. Namely, the only task that (147) attributes to complex demonstratives is to pick out an object from the context, i.e., a singular content that remains opaque to modal quantification. Thus, this theory

[59] This means that the δ function is, simply, what in semantic theorizing is usually called a "choice function". Choice functions are not particularly common in the literature, but they have nevertheless been employed for a number of purposes (cf. Reinhart 1997, Winter 1997, Kratzer 1998b).

straightforwardly qualifies as a variant of c-theories. The rest of this dissertation is devoted to showing that this theory can accommodate all the counterevidence from section 2.2.1.2, i.e., that any c-theorist willing to embrace (147) or a variant thereof will find herself in a position to deal with all the counterexamples to c-theories in semantic terms – although, as we shall see, we still need to implement some additional but independently motivated adjustments to the syntax and semantics of verbal morphology. But, before discussing the problematic counterevidence, let me mention some issues related to this lexical entry. In particular, I shall address ten possible worries that may be raised concerning (147).

The first worry is probably the most straightforward complaint that can be raised against my account: isn't there some degree of randomness as to which object is selected in each context? Dropping requirements such as, e.g., having to be demonstrated by the speaker may lead to an unsatisfactory result: I may be aware of all the objective features of the context of utterance (who is speaking, who is listening, where we are located, etc.) and yet not know what the referent of the demonstrative is. This is a fair worry, so let me briefly address it.

The discussion in the previous section should have made it clear that these concerns do not pertain to semantics. Semantic constraints in the selection of a suitable referent for a demonstrative lead to undesirable results, so these principles should better be built into the pragmatics. My function δ is part of the context, but it is not something that can be determined just by looking at the physical setting in which an utterance takes place. This means that, given a certain utterance (understood as an actual event taking place in a physical environment), there is still no semantic rule able to univocally guide speakers and hearers in selecting *the* referent of a complex demonstrative. Is this a problem? It is, but not greater than, say, the problem of selecting the appropriate assignment function. Formal contexts are composed of parameters that need to be drawn from the actual speech situations they purport to represent, but the relationship between the former and the latter is far from transparent. Let me expand a bit on this.

Demonstrative pronouns like "he" or "she" are usually modeled as variables, i.e., their value is fixed by the assignment. Insofar as this function is just another parameter of the context, these words are not different from expressions like "I", "here" or "now": both categories of words are, simply, directly referential terms with a non-constant character.

However, indexicals like "I", "here" or "now" are often thought to be essentially different from demonstratives. Namely, Kaplan called the former "pure indexicals" because their referent could be automatically determined just by looking at the objective features of a physical setting; this is, of course, not the case of demonstratives in general. King (2013, 2014a, 2014b, 2020), for example, uses the label "supplementives" for referring to demonstratives and other context-dependent terms whose "*context invariant meanings don't by themselves suffice to secure semantic values for them in context*" (King 2020: 56). Many other authors have endorsed a distinction along these lines (cf. Perry 2001, 2017; Georgi 2015, 2020; King & Glanzberg 2020).

Arguably, the constraints on reference-fixing rules for demonstratives that we discussed in the previous section were meant to counter the lack of objective rules for settling the referent of a demonstrative. They were intended, so to put it, as a way to make demonstratives behave more like pure indexicals, i.e., as terms whose reference can be automatically determined. I do not think, however, that these attempts are on the right track. For one thing: it is not clear that the distinction between pure indexicals and demonstratives (or supplementives) is even grounded. Several authors (Vision 1985, Sidelle 1991; Predelli 1998a, 1998b, 2005a; Corazza et al. 2002; Romdenh-Romluc 2002, 2006) have put forward important reasons for thinking that the value of so-called "pure indexicals" cannot be settled just by paying attention to allegedly objective features of the context. Namely, there are uses of indexicals that cannot be captured by the naïve semantic rules usually attributed to pure indexicals ("I" refers to the utterer, "now" to the moment of utterance and so on). Consider (149)-(151):

(149) I am not here now (written on a note attached to my office door)

(150) *Now* the French are invading England (as uttered by a historian)

(151) Never put off until *tomorrow* what you can do today

These uses of pure indexicals are, at the very least, puzzling from the perspective of someone willing to maintain the above distinction between two main classes of context-dependent expressions. In spite of being pure indexicals, it is rather clear that they cannot be taken to refer to something easily determinable by objective features of the context of utterance. The indexicals in these examples require the appeal to different mechanisms, such

as deferred utterances (Sidelle 1991), speaker intentions (Predelli 1998a, 1998b, 2004, 2005a), conventions (Corazza et al. 2002) or features that can be determined in the context of utterance but that nevertheless do not coincide with any utterance parameter (Vicente & Zeman 2020). It might also be argued that a plethora of these factors may conspire together in order to obtain the right value (cf. Glanzberg 2020).[60] In a nutshell: determining the value of a pure indexical can be as complex and subjective as determining the referent of a demonstrative. This complexity undermines the idea that there is a principled distinction between these two categories of words.

What I intended to show by discussing this distinction is that the randomness in (147) is inescapable. Admittedly, my function δ cannot be determined just by looking at the physical setting in which an utterance takes place. This does not mean that it should not be part of the context, or that it should be qualified some way or another so that it should pick out some demonstrated object: all it means is that the relationship between utterances and the technical notion of *sentence-in-a-context* is far from trivial. Even if contexts contained only the parameters required for pure indexicals, their relationship to actual utterances would not be straightforward, and, at any rate, such relation is not a semantic one.[61] Contexts may be thought of as a formal representation of the values required for indexicals, but the manner in which these values are to be determined is something pre-semantic – something that, as I mentioned above, should not be incorporated into the lexical meaning of any term. I will remain neutral as to which kind of principles determine the value of "he", "she", "that" or "that man"; perhaps they depend on intentions, perhaps on conventions, perhaps on a mixture of factors. But, for the record, this just stresses a crucial feature of my account: complex demonstratives are to be understood on the model of pronouns.[62] And establishing how the reference of a pronoun is to be fixed is a problem for me as much as it is for everyone.

---

[60] Glanzberg's theory is in principle meant to hold only for what King calls "supplementives", but it could arguably be extended to pure indexicals.

[61] Arguably, the work by Sidelle (1991), Predelli (1998a, 1998b, 2004, 2005a), Corazza et al. (2002) and Romdenh-Romluc (2002, 2006) may be seen as an attempt to find the right way to link sentences in a context to actual utterances. Gauker (2010) states this assumption formally. See Georgi (2019) for criticisms towards these authors; on his view, these attempts threaten to trivialize the notion of character.

[62] Just to make it clear, this is in no way in conflict with what I argued for at length in section 2.2.2, namely that the "that" occurring in a complex demonstrative is not a pronoun but a determiner, *pace* Lepore & Ludwig (2000). When I say that complex demonstratives should be understood on the model of pronouns, what I mean

The second worry is closely related to the first one, and it concerns the relationship between complex demonstratives and definite descriptions. Recall how I defined my δ function: given a context *c* and a property P, δ_c selects a random object satisfying P in i_c. One might wonder, however, why δ should select *an* object satisfying P rather that *the* object satisfying P. If character is supposed to pick out a unique salient individual given a context, it seems reasonable to just regard complex demonstratives as the natural language counterpart of Kaplan's '*dthat*' operator, i.e., as a rigidified definite description[63] – Neale's (1993) position is a clear representative of this idea.

Here is the answer: reasonable though as it might seem, assimilating complex demonstratives to rigidified definite descriptions is incorrect and, in fact, unnecessary. The reason of its incorrectness is, simply, that it gets things wrong; recall the above contrast between (131a-b):

(131a) The bottle is on the table and the bottle is not on the table

(131b) That bottle is on the table but that bottle is not on the table

(131a) comes out as self-contradictory because a unique bottle is presupposed (or asserted) to exist, but (131b) is perfectly felicitous. What this means is that we need each of the two occurrences of "that bottle" to pick out a different object, meaning that there cannot be a unique salient bottle per context. The uniqueness requirement typical of definite descriptions is therefore incorrect. More accurately, demonstratives are an instance of what

---

is that the combination of the determiner "that" plus a nominal results in something, a complex demonstrative, whose semantics is analogous to that of pronouns (and that may therefore be regarded as a kind of pronoun (Swanson 2005)). This is very different from saying that the "that" whose meaning is given by (147) is a pronoun. Only the combination of this "that" and an N´ results in something that may be considered as such. Although for different reasons, a similar idea was put forward by Dorothy Grover, in the context of her *prosentential theory of truth* (1972), regarding sentences like "this is true". On her view, this sentence is a semantically indivisible whole standing for the content of another sentence – its antecedent. This means that the sentence itself works pretty much as a pronoun. Thanks to Jordi Valor for suggesting this comparison.

[63] There is, in fact, a straightforward way to convert (147) into a lexical entry for Kaplan's "dthat". All we need is to constrain the character of "that" so that it ranges only over singletons:

(147*) $[\![\text{dthat}]\!] = \lambda c.\ \lambda i.\ \lambda P\text{: } |\{x \mid P(i_c)(x) = 1\}| = 1.\ \delta_c(P)$ (where the first "1" stands for the truth value, the second one for the natural number, and, for any set Q, |Q| is the cardinality of Q)

This lexical entry meets many of the desiderata Kaplan wants for "dthat"; namely, each expression of the form "dthat F" will be a singular term and, in fact, directly referential. Of course, it does not abide by the Mirroring Thesis. I do not see this as a problem.

Georgi (2015, 2020) calls "referentially promiscuous expressions",[64] i.e., terms able to refer to different things in a single context. Here is his official definition of referential promiscuity:

> REFERENTIAL PROMISCUITY
>
> An expression *e* of a language *L* is referentially promiscuous if and only if there are distinct free occurrences O_1 and O_2 of *e* in a sentence *s*, and some context *c*, such that the content of O_1 relative to *c* is distinct from the content of O_2 relative to *c*. (Georgi 2020: 129)

It is an open empirical question which expressions are referentially promiscuous in this sense. Demonstratives and variables are obvious candidates for fitting the definition, but some may also want to include time adverbials like "now" (cf. Iacona 2009, 2010), or even any expression including variables at some level of representation, such as quantifiers (cf. von Fintel 1994) or common nouns (cf. Stanley & Szabó 2000). But, even assuming that quantifiers or common nouns may include variables for implicitly restricting their domains, the straightforward validity of inferences like "if the king of France is bald, then the king of France is bald" should be enough to rule out the possibility that definite descriptions are referentially promiscuous expressions (although see footnote 46 above). This also suffices for rejecting the idea that complex demonstratives can be definite descriptions of a special kind.

This leads me to the third concern: how to deal with referential promiscuity. The usual way to do it, and the one that I will be using throughout this dissertation, is, simply, syntactic co-indexing. This is a very common way to deal with the phenomenon (cf. Lewis 1970, Burge 1974, Kaplan 1977, Larson & Segal 1995, Lepore & Ludwig 2000), and it can be implemented in a straightforward manner: let each phrase of the form "that F" be subscripted a number $n \in \mathbb{N}$, let each context *c* contain not just a function δ_c but indefinitely many $\delta_c^1 \ldots \delta_c^n \ldots$, and let me modify (147) accordingly:

(147a) For each $n \in \mathbb{N}$, $[\![[\text{that F}]_n]\!] = \lambda c.\ \lambda i.\ \delta_c^n([\![F]\!]^c)$

[64] As Georgi acknowledges, his use of the term "referential promiscuity" differs from that of Arthur Sullivan's (2013: §4.4), who uses it as a label for context-dependent expressions in general.

Many authors, however, would express their reservations towards this approach. One of the main points behind the essays by Braun (1996) and Salmon (2002) is that the idea that contexts contain sequences of parameters such that "$that_n$" refers to the *n*th parameter of the sequence is not a philosophically promising approach to referential promiscuity. For one thing: what (147a) is interpreting is not a fragment of English, but rather of a regimented language enriched with subscripts. In the worst scenario, (147a) can be seen as a theory that postulates ubiquitous ambiguity: English contains infinitely many words pronounced "that". And, arguably, keeping the lexicon at a minimum is a desideratum of any semantic theory. Disconformity with co-indexing has led many authors to develop alternative accounts of referential promiscuity; for example, Elia Zardini (2014) and Mark McCullagh (2020) set out to develop logics that allow contexts to change in the middle of an argument, and Georgi (2015, 2020) supplies contexts with an occurrence-tracking parameter.[65] These ideas were already present in Braun (1996), and they have an important antecedent in Groenendijk & Stokhof's (1991) Dynamic Predicate Logic.

Regardless of the merits of these approaches, I will stick to syntactic indexing for simplicity's sake. I feel particularly attracted to the idea of incorporating an occurrence tracking device, but to a great extent the differences are terminological and the system defended here could be easily adapted to any of the options mentioned above. In fact, and just for the purposes of the exposition, I will be abstracting away from these problems and, unless otherwise noted, I will assume at most one occurrence of a demonstrative *per* sentence throughout the rest of this dissertation. This makes indexing unnecessary, although it will be re-introduced when required for discussing some particular examples. Let me just add one final word on the topic: the fact that complex demonstratives require mechanisms for distinguishing various occurrences in a sentence is revelatory about one of the main features

[65] Georgi's approach is more ambitious, for it makes room for notions like "validity at a context" and "logical consequence at a context". On his approach, a sentence like "that is that" may be valid with respect to some contexts but not with respect to others, depending on whether the two occurrences of "that" are coordinated in the context in question (the term "coordination" is taken from Kit Fine (2003, 2007)). This marks a substantial difference with systems employing syntactic co-indexing, for these approaches usually count sentences like "$that_1$ is $that_1$" and "$that_1$ is $that_2$" respectively as valid and non-valid *simpliciter*, although these frameworks could be also adapted in order to fit such notions. As far as I can see, the semantics I defend can easily dispose of indexing and be adapted into a system incorporating Georgi's device, and it is also compatible with a notion like "validity at a context".

of my account, namely, that complex demonstratives are to be understood on the model of pronouns. Sentences like (131b) resemble (131c-d) rather than (131a):

(131c) He is on the table but he is not on the table

(131d) You are on the table but you are not on the table

It is reasonable, in fact, to assume that the functioning of the descriptive meaning of a complex demonstrative is just analogous to that of Φ-features: the nominal plays the very same role as the feminine and masculine features of pronouns like "she" or "he", respectively. I will come back to these issues in section 3.3.3.

Let me now move on and discuss two closely related worries. These concern "these" and "those", on the one hand, and "this" and "these", on the other. In other words, let me discuss how to implement *plurality* and *distality* features into the current theory. The most natural way to modify (147) in order to deal with plural versions of "that" is, simply, to add another function in the context: let each context *c* contain, in addition to δ_c, a function Δ_c that takes properties as arguments and returns, as values, subsets of the objects satisfying those properties in the circumstance of the context. Formally, each context *k* should be supplied with a function Δ_k: $\Pi \rightarrow \wp(E)$ such that, for each $P \in \Pi$, $\Delta_k(P) \subseteq P(i_k)$. And the semantics for "those" is straightforward:

(147b) $[\![\text{those}]\!] = \lambda c.\ \lambda i.\ \lambda P.\ \Delta_c(P)$

Thus, the role of "those men" is to go to a context, see which individuals satisfy "being a man" in the circumstance of the context, and return a subset of those individuals. This proposal is merely tentative, for plural complex demonstratives are not my primary concern in this dissertation, but this is the natural way to extend (147) in order to accommodate plurality. Namely, (147b) is as context-dependent as (147), it incorporates the very same restrictions, and the set of referents is obtained in exactly the same manner. Arguably, (147b) yields the result that the relation between "that" and "those" is analogous to that between "I" and "we", i.e., it renders each phrase of the form "those F" semantically analogous to a plural pronoun – an idea I am very happy to embrace. The semantics of plural pronouns has its own

problems[66] (one could, for example, wonder whether Δ should rather map properties to *strict* subsets of the individuals satisfying them), but we can abstract away from them in this dissertation.

The other worry concerning Φ-features (or something similar) has to do with distality and proximality features. "This" and "that" are obviously not interchangeable in all speech situations, for they presuppose (in a pre-theoretical sense of "presuppose") that the object referred to is close and distant, respectively. A naïve way to implement this difference is to lexicalize it as a semantic presupposition triggered by the demonstratives:

(147c) $[\![\text{that}]\!] = \lambda c.\ \lambda i.\ \lambda P$: $\delta_c(P)$ is distant from a_c in i_c. $\delta_c(P)$

(147d) $[\![\text{this}]\!] = \lambda c.\ \lambda i.\ \lambda P$: $\delta_c(P)$ is close to a_c in i_c. $\delta_c(P)$

However, the discussion in 3.1.1 should have taught us to view this kind of lexical entries with suspicion. We do not want to count (152a-b) as valid:

(152a) If that_1 exists, that_1 is distant from me

(152b) If this_1 exists, this_1 is close to me

For these reasons, I am inclined to think that distality features play a merely pragmatic role in aiding the hearer to choose the intended referent. I am not entirely satisfied with this idea, for it entails that "this" and "that" have exactly the same meaning in spite of their markedly distinct morphology, i.e., that there are morphosyntactic differences that have no reflection in the semantics. But, at any rate, I think it is clear that distality and proximality should be left out of the truth-conditional contribution of a demonstrative.[67] Whether their contribution is merely pragmatic or whether it plays a semantic but non truth-conditional role is something I leave as an open question for other work. For the moment, these concerns, just like those above, can be left aside.

[66] See, e.g., Schlenker (2003b, 2009) for plural pronouns.

[67] Or perhaps not. It could be argued that (152a-b) are analytic after all. In fact, they do not seem too different from (l):

(l) She is a female

Arguably, it is much easier to see (l) as analytic, and a lexical entry like (145) above predicts that it is. Perhaps (152a-b) are pretty much like (l). There is a reason for thinking so: nothing in the syntax or morphology of "this" and "that" entails that the object referred to should be demonstrated, but these words do incorporate a morphological mark to the effect that the relevant object should be at a certain distance. In this sense, distality is like gender and importantly different from demonstrations and other instructions for finding a referent.

Let us address the sixth worry. One might wonder what happens when no object satisfies the descriptive content of the demonstrative. (147) predicts that an utterance of "that unicorn" or "that square root of minus 2" in the actual world will be uninterpretable, for the δ function is defined only over non-empty properties. Intuitively, this is right – this is the option chosen, for instance, by Borg (2000), Salmon (2002) and Glanzberg & Siegel (2006). Other authors, however, may feel more attracted to other options. For example, Braun (2008a) insists that, when the complex demonstrative has an empty extension, sentences containing it still express propositions, only that these contents are gappy, i.e., neither true nor false. Yet another option is to argue that sentences containing empty demonstratives always express false propositions. I do not mean to adjudicate between all these options. They yield slightly different predictions, for example, when it comes to the interaction of empty complex demonstratives and attitude reports,[68] but facts are too fuzzy and too theoretically loaded to empirically rule out any of these alternatives. Since the most popular option seems to be uninterpretability, I will stick with this one. But it is possible to modify the δ function so as to deal with empty terms. For example, it could be defined thus:

(153) For each context *c*, there is a function δ_c: $\Pi \rightarrow E$, such that, for every $P \in \Pi$,

(i) If $\{x \mid P(i_c)(x) = 1\} \neq \emptyset$, then $P(i_c)(\delta_c(P)) = 1$

(ii) If $\{x \mid P(i_c)(x) = 1\} = \emptyset$, then $\delta_c(P) = \dagger$, where † is an object not in E

Then there could be a semantic clause specifying that sentences containing † express gappy or false propositions, depending on one's favorite choice. Yet another option is to modify clause (153ii) so as to make δ assign a random object from E to the empty property. As stated above, I do not mean to adjudicate between all these options – I am just mentioning them so as to make the reader aware of their existence and to ensure that my system is compatible with them.

[68] Take a sentence like (m):

(m) Jean believes that *that square root of minus 2* is a cool number

Proponents of uninterpretability are committed to saying that (m) is uninterpretable. However, advocates of gappy contents can say that Jean believes a gappy proposition, and those advocating for falsity can state she believes a false one. The latter two can even count (m) as true.

Seventh worry: is it possible to deal with bare demonstratives in terms of (147)? It should be clear from the discussion in 2.2.2 that I do not endorse treating bare demonstratives as a special case of the complex ones. What I called "the adnominal thesis" is attractive, but, on my view, we have no reasons to regard it as more accurate than the dual one, i.e., the idea that the two "that"'s that English contains – the pronoun and the determiner – are different lexical items (alternatively, the dual thesis may also hold that they are variants of the same word, although this variation should be not just syntactic but also semantic). Since I do not seek a unified treatment of both kinds of expressions, I am happy to deal with bare demonstratives pretty much like (nonrestricted) c-theorists do, i.e., by positing a sequence of demonstrata $d_c^1 ... d_c^n ...$ for each context *c*. The meaning of the pronoun can be captured by a lexical entry like the following:

(154) For any $n \in \mathbb{N}$ $[\![\text{that}^{\text{PRON}}{}_n]\!] = \lambda c.\ \lambda i.\ d_c^n$

Of course, these demonstrata need not be anyhow demonstrated in the context: they are just a purely formal parameter. Alternatively, bare demonstratives can be treated as variables – the difference is mostly terminological.

However, there might be advocates of the adnominal thesis who would like to adapt (147) for bare demonstratives. Since I do not regard the evidence from 2.2.2 as a knockdown argument against their position, let me just mention a couple of options for adjusting this lexical entry. A possible option is to posit a hidden variable for properties in the syntax of "that". If no nominal fills this slot (i.e., if the demonstrative turns out to be bare), then it should be assigned a contextually determined property. Another possibility is, simply, to regard bare "that" as a shortened form of "that thing", pretty much like Taylor (1980) or Barwise and Cooper (1981) do. Thus, (147) predicts that bare "that" will be assigned any object of the domain.

Relatedly, one might want to adapt (147) for adjectival "that". This is the eighth concern so far and, although it is relevant only insofar as we want to deal with languages other than English, let me say that no adaptation is actually needed. Recall that adjectival complex demonstratives usually display the form of a determiner phrase:

(155) The man that

This string is interpretable in many languages, but, as I argued by the end of section 2.2.2, we have good reasons to think that the determiner "the" is added only on the basis of syntactic constraints, i.e., that it is a dummy determiner with no semantic relevance. Thus, the only interpretable elements of this string are "man" and "that". And, as long as their respective nodes are sisters, this should yield no problems of interpretability. Namely, "that" can be given exactly the semantics in (147), and functional application will ensure that it combines with "man" in the right manner for selecting an object.

One might also wonder whether this lexical entry is exclusive for c-theories or it can be adapted to other approaches treating complex demonstratives as singular terms. Multiple proposition theories are more heterogeneous than c-theories, so it is not clear that the lexical entry is easily adaptable in all cases – this is particularly problematic for the case of mp-theorists endorsing a Stalnakerian conception of contexts. However, (147) can be easily formulated in a way that suits multiple proposition theories as long as these are willing to acknowledge that the content of a sentence in a context may depend on something like the δ function. In that case, all the mp-theorist needs is, simply, something along these lines:

> (156) For every context *c*, any sentence of the form "That F is G" expresses in *c* the following two propositions:
>
> i) $\lambda i.\ \delta_c([\![F]\!]^c)$ is G in i
>
> ii) $\lambda i.\ \delta_c([\![F]\!]^c)$ is F in i.

The results are pretty much the same c-theories would obtain, but I still think that the latter are preferable. The reason is that any proposition defined by means of the clause in (156ii) seems completely unnecessary, for it is contextually vacuous given the definition of the δ function. Thus, any modification of (147) along the lines of (156) seems redundant. The adjustments that I proposed in this section are therefore better suited for c-theories than they are for multiple proposition theories, for the extra proposition the latter need to invoke is vacuous. This discussion should make clear, however, that these adjustments can also be easily embraced by most multiple proposition theorists.

The tenth and final worry will be addressed in section 3.3.3, but it deserves at least a brief mention. One might wonder whether there are formal alternatives to (147). In particular,

some theorists may still want to call the referent of a complex demonstrative a "demonstratum", others perhaps would argue that the δ function does not fit with a normal understanding of Kaplanian contexts, and others might like to treat complex demonstratives as if they were variables. Let me just say that the particular formalism in which this lexical entry is stated is far from essential to my theory, and that all the options just mentioned are compatible with this particular way of understanding complex demonstratives. But, before providing some alternatives in the aforementioned section, it is better to try to convince the reader that (147) is the best way to understand these expressions. In the next section I address all the counterevidence raised by King and others. Any modification of c-theories along the lines of (147) can tackle every problematic counterexample, as long as a couple of additional and independently motivated adjustments are implemented.

3.3 Responses to the semantic counterevidence

Recall from the discussion in 2.2.1.2 that the c-theorist was faced with five types of problematic counterexamples: QI-uses (including NS-readings), NDNS-readings, variants of Bach-Peters sentences, anaphoric uses and bound variable readings. In this section I argue that all these types of counterevidence boil down to just two: they may be either a case of E-type anaphora or the result of the interaction of the demonstrative with a monster operator. These two mechanisms generate non-deictic readings of any indexical, so it is no surprise that they render the demonstrative non directly referential. Importantly, these facts allow the c-theorist to maintain her two main tenets: complex demonstratives are singular terms, and the descriptive meaning of a complex demonstrative contributes to the *character*, and not the content, of the term. In turn, this means that quantificational theories are unnecessary.

The first complication I set out to solve is the problem of QI, which probably constitutes the most important source of counterevidence against standard c-theories. As I explain below in 3.3.1.1, Kaplanians willing to make their systems more flexible may think that the answer is straightforward: if the character of the term is given by the nominal, and this nominal is being quantified into by an external binder, then the latter is operating on the character of the term. Operators on character result in the impossibility of referential uses of any indexical under their scope, so it is no surprise that complex demonstratives subject to QI do not pick

out any particular individual. This argument, however, is not enough for establishing the plausibility of c-theories, as arguments in King (2008c) made clear, for the truth-conditions predicted by c-theories employing (147) are still mistaken.

The solution, however, is also independently motivated. As I explain in 3.3.1.2, we have good reasons for adopting a system with explicit representation of time and world variables in the object language. As I shall argue, the changes that we need in order to implement such system are enough for responding to the objection by King (2008c). In fact, these changes allow us to deal with many NDNS-uses as a special case of QI-readings, as I explain in 3.3.1.3. In that very section I also provide two possible ways to implement these changes into c-theories: either through the adoption of an extensional system that disposes of intensions, or by means of a slightly more complex system that allows the c-theorist to preserve them. I call these two solutions the "*extensional solution*" and the "*circumstance-binding*" solution, respectively. This way of accounting for QI-uses will lead me to a philosophical discussion on the notion of monster in section 3.3.2, where I explain the motivation for embracing this kind of operators and their relationship with two central notions in semantics, namely *compositionality* and *assertoric content* (section 3.3.2.1). I also say a word on the right way to conceive the difference between notions like *direct reference*, *Millianism* and *singularity* (3.3.2.1).

As I explain in 3.3.4, not all the counterevidence can be reduced to a case of quantifying in. Many anaphoric and NDNS-uses, for example, involve no binding into the demonstrative, and Bach-Peters sentences require something besides mere binding. However, all these problems can be regarded as instances of E-type anaphora – either discourse anaphora or donkey anaphora. Virtually every pronoun displays this kind of uses, so complex demonstratives (which, I maintain, are to be understood on the model of pronouns) need not be treated any differently. Building on proposals that have been previously put forward for pronouns in general, I offer several possible treatments for E-type anaphoric complex demonstratives.

In section 3.3.5 I provide different ways to deal with NDNS-uses. We will see that c-theorists embracing what I called the "circumstance-binding solution" may straightforwardly count these cases as instances of QI, whereas advocates of the extensional solution, in spite

of not being able to resort to monsters in this case, can still very plausibly appeal to pragmatics (3.3.5.1). Importantly, both solutions are able to treat NDNS attitude reports as instances of QI-uses, a treatment that is very natural once a system with overt world and time variables has been embraced (3.3.5.2). I also offer some (tentative) crosslinguistic evidence in favor of this analysis; namely, I suggest that the use of subjunctive in Romance languages suggests that complex demonstratives only display non-deictic uses when they are subject to QI (3.3.5.3) – an idea that strongly favors c-theorists. I also argue that these ideas fit very nicely with a certain contrast, first noticed by Lindsey Wolter (2006; see also Nowak 2019a), between complex demonstratives containing a relative clause and those containing simply a nominal.

The last bit of counterevidence, bound variable uses, is discussed in 3.3.3. As the discussion from 3.3.2 will make clear, these also qualify, rather straightforwardly, as cases of monstrous quantification into the character of the demonstrative – albeit the mechanism is different from QI. As a corollary of this discussion, I tentatively suggest that we should better drop the notion of context and to treat all indexicals, including complex demonstratives, as variables, i.e., as expressions whose value depends on the assignment function. I suggest many possible solutions for dealing with bound variable readings. If these claims are right, by the end of this section we will have certified that c-theories are able to accommodate all the counterexamples that have been put forward against them. It will then be the time to move on and discuss why they are superior to their competitors, as I do in 3.4.

3.3.1 Monsters

Monsters are usually thought of as context-shifters (Israel & Perry 1996, von Stechow 2004, Anand & Nevins 2004). It is also usual to regard as a monster any operator responsible for indexical shift (Schlenker 2003, Santorio 2012, Jaszczolt & Huang 2017). Another usual conception of "monsters" defines them as operators on character or hyperintensional operators. Kaplan himself was not entirely clear in his definition, for he provided at least three non-equivalent ways to understand them (Predelli 2014): context shifters, character

shifters and a third category that Predelli dubs "global shifters".[69] But, actually, all the above notions overlap to a great extent. Recent philosophical discussions have set out to clarify the notion of monster (Rabern 2014, forthcoming; Teixeira & Basso 2014; McCullagh 2018; Rabern & Ball 2019; Santorio 2019; Yalcin 2019), and a consensus has been apparently reached: each of the usual definitions is nothing but a particular instance of an operator on character – or, equivalently, a hyperintensional operator.

Kaplan's primary example of a monster was the artificial "in some contexts" that he devised, repeated below:

$[\![\text{In some contexts}]\!] = \lambda c \in C.\ \lambda i \in I.\ \lambda h \in H.\ \exists k \in C\ (h(k)(i)=1)$

Allowing operators of this kind may result in attributing to sentences like (21b) readings that they do not actually display; namely, they would mean something like (21e) (or, alternatively, (21d)), which has nothing to do with the agent of the actual context:

(21b) In some contexts I am tired

(21e) $\lambda c.\ \lambda i.\ \exists k \in C\ (a_k \text{ is tired in } i)$

(21d) <<the agent, being tired>, being true in some contexts>

I.e., context-shifters result in indexical shift – which is, on the other hand, straightforward, given that context is the parameter on which the value of indexicals depends. Additionally, Kaplanian contexts are the argument to character, meaning that any operator shifting that parameter is an operator on character. And, since content and character are, respectively, intension and hyperintension, monsters are hyperintensional. This means that, on Kaplan's system, all these notions coincide.

Consequently, discussions on monsters were initially framed mostly as an empirical question. The studies by Philippe Schlenker (2003a) on Amharic,[70] and Pranav Anand and

[69] A global shifter is an operator that does not just shift the context, but also the circumstance in which it is being assessed. For example, a globalized version of "in some contexts" may be rendered thus:

$[\![\text{In some contexts}_{GL}]\!] = \lambda c.\ \lambda i.\ \lambda h \in H.\ \exists k \in C\ (h(k)(i_k)=1)$

This is, in fact, an operator that is both intensional and hyperintensional. Adding these operators into a language could have important consequences when it comes to logical truth, given Kaplan's understanding of the notion.

[70] Amharic is a Semitic language. It is the official language of Ethiopia, where it is spoken by around 22 million people.

Andrew Nevins (2004) on Slave[71] and Zazaki,[72] are examples of this kind of reasoning: I find a language where indexicals appear to be shiftable, I thereby posit operations on context as the mechanism responsible for such phenomenon and, since my system counts contexts as the argument of character, I therefore infer that hyperintensional operators exist in natural language. Other discussions are framed in more conceptual terms, but they are nevertheless aimed at showing that certain empirically attested phenomena are better accommodated by acknowledging the presence of monsters. For example, Israel & Perry (1996), Santorio (2012) and Gimeno-Simó (2018, 2020b) argue that natural languages need monsters in order to tackle the phenomenon of essential indexicality as first formulated by David Lewis (1979) and John Perry (1979), whereas Jaszczolt & Huang (2017) argue that a proper treatment of mixed quotation requires a monstrous system. These phenomena suggest that perhaps our semantic systems should be made more flexible by lifting Kaplan's ban.

As we shall see in 3.3.2, the problem is actually much less empirical than it might *prima facie* seem. Ultimately, whether an operator counts as a monster is strictly dependent on one's theoretical commitments to notions like *assertoric content* – Kaplan's *what is said*. Shifting the context, *qua* operation, is monstrous only insofar as the role of context is understood in the same way Kaplan does, and *mutatis mutandis* for the phenomenon of indexical shift. At any rate, one thing is clear: in a Kaplan-style framework, hyperintensional operators shift the context, and therefore they shift the semantic contribution of indexicals. This provides what appears to be a straightforward response to the problem of QI. Namely, the current system, paired with a rejection of the monster prohibition, yields the prediction that QI uses of complex demonstratives are not directly referential.

3.3.1.1 A straightforward response?

It is very tempting to say that the problem of QI is easily accommodated simply by assuming the presence of monsters. Notice that QI-sentences like (77) or (78), repeated below, involve quantifying into the complex demonstrative:

[71] Slave is an Athabaskan language from the Canadian Northwest Territories, where it is spoken by approximately 2,000 people.
[72] Zazaki is an Indo-European language spoken by an estimate of 2-4 million ethnic Kurds in Eastern Turkey.

(77) [Every queen]$_1$ cherishes that cleric who crowned her$_1$

(78) [Every skier]$_1$ remembers that first black diamond run they$_1$ attempted to ski

In c-theories, operating on the nominal of the complex demonstrative is equivalent to operating on its character. In (77), the descriptive material "cleric who crowned her" is supposed to provide the character of the whole expression, but this material is being quantified into by an external operator, i.e., the binder of "her" – and *mutatis mutandis* for the case of (78). This means that the external binder is a monster. Character is supposed to pick out an individual given a context, but the semantic value of "that cleric who crowned her$_1$" in (77) is not just a function of contexts, but rather of contexts and individuals. It is therefore no surprise that, given a context, the term is still unable to pick out a unique object.

This appears to be the straightforward solution to the problem of QI. My lexical entry (147) predicts that (77) should receive the following truth-conditions (the semantic contribution of the complex demonstrative is underlined):

(77d) λc. λi. ∀x (*x* is a queen in *i* → *x* cherishes $\underline{\delta_c(\lambda j.\ \lambda y.\ y \text{ is a cleric in } j \text{ and } y \text{ crowned } x \text{ in } j)}$ in *i*)

These truth-conditions correctly predict that the complex demonstrative in (77) can be employed non-deictically. Loosely speaking, each of the queens *x* determines a different property (namely, the property of *being a cleric who crowned x*), with the result that the function δ picks out a different individual for each queen. Let us make this sure by providing a stepwise calculation of the truth-conditions of (77). Assume the following simplified logical form for the sentence:

(77d) [Every queen] λ1. t$_1$ cherishes that cleric who crowned her$_1$

Let me introduce some terminology in order to adapt the usual mechanism for variable binding for the current theory. Namely, "c(x/n)" should represent, for each context *c*, the context that is just like *c* except that $g_{c(x/n)}$ assigns the object *x* to the variable *n*. For simplicity's sake, assume that "cleric who crowned" is a syntactic unit with the following

semantics: *λc. λi. λx. λy. y is a cleric and y crowned x in i*.[73] Let me also simplify the matter by abstracting away from the tense of "crowned", i.e., pretend that its tense is just present. The truth-conditions that the current theory predicts for (77) in some random context *c* and circumstance *i* are the following:

1. $[\![$[Every queen] λ1. t_1 cherishes that cleric who crowned $her_1]\!]^{c, i}$ = 1 iff (by the lexical entry of "every", the definition of the λ abstractor and the lexical entry for "queen")

2. $\lambda P_{<e, t>}$. ∀x (*x* is a queen in *i* → Px) (λy. $[\![t_1$ cherishes that cleric who crowned $her_1]\!]^{c(y/1), i}$) = 1 iff (by the lexical entry of "cherish" and the semantics for variables)

3. $\lambda P_{<e, t>}$. ∀x (*x* is a queen in *i* → Px) (λy. y cherishes $[\![$that cleric who crowned $her_1]\!]^{c(y/1), i}$ in *i*) = 1 iff (by (147))

4. $\lambda P_{<e, t>}$. ∀x (*x* is a queen in *i* → Px) (λy. y cherishes $\delta_{c(y/1)}([\![$cleric who crowned $her_1]\!]^{c(y/1), i}$) in *i*) = 1 iff (by the lexical entry of "cleric who crowned", IFA and the semantics for variables)

5. $\lambda P_{<e, t>}$. ∀x (*x* is a queen in *i* → Px) (λy. y cherishes $\underline{\delta_c(\lambda j.\ \lambda z.\ z \text{ is a cleric in j and z crowned y in j})}$ in *i*) = 1 iff (by λ instantiation)

6. ∀x (*x* is a queen in *i* → *x* cherishes $\underline{\delta_c(\lambda j.\ \lambda y.\ y \text{ is a cleric in j and y crowned x in j})}$ in *i*

The λ abstractor shifts the assignment function, and therefore the context in which we are assessing everything under its scope. Thus, the complex demonstrative is not assessed with respect to the function δ_c; rather, each queen *x* determines a different function, $\delta_{c(x/1)}$, with the result that the demonstrative picks out a different object for each of them. This suffices for accounting for the non-deictic nature of this complex demonstrative. These facts should come as no surprise, as shifting the assignment function is a monstrous operation (Rabern 2013).

The current system therefore correctly predicts that complex demonstratives subject to QI will always fail to pick out an individual. However, this is yet not enough, for we still get the wrong result once we take intensionality into account: (77d) is true in a context *c* and a

[73] Of course, this is just a simplification. The right way to combine these two predicates is explained in the next subsection.

circumstance *i* iff every *x* such that *x* is a queen in *i* cherishes in *i* a certain object, $\delta_c(\lambda j.\ \lambda y.$ *y* is a cleric in *j* and *y* crowned *x* in *j*), with the condition that this object be a cleric who crowned her not at *i*, but at i_c. Thus, the cleric is required to have performed the crowning at the world and time of the context, instead of the circumstance of evaluation. Of course, this is wrong: (77) should be true in any circumstance *j* such that every queen in *j* cherishes an object that is a cleric and crowned her in *j*. In other words, it should not be context-dependent. King (2008b: 103-104, footnotes 9, 21 and 24) raises the very same problem for any theory dealing with complex demonstratives as a formal counterpart of Kaplan's "dthat". Let me dub this "*the problem of intensional mismatch*".

Let me illustrate what exactly is at stake by briefly discussing King's version of the problem. The difficulty lies in the fact that both my (147) and Kaplan's "dthat" remain anchored to the context of utterance. Assume that (77) is translated into Kaplan's system as (77e) below. Its truth-conditions, given in (77f), suffer from exactly the same problem:

(77e) [∀x: x is a queen] (x cherishes dthat (the cleric who crowned x))

(77f) λc. λi. ∀x (x is a queen in i → x cherishes dthat (the unique y such that y is a cleric in i_c and y crowned x in i_c) in i)

Take a random world w_7 which is just like the actual world except that queen Victoria was not crowned by William Howley but by some other cleric – say, Tomás de Torquemada. Assume, too, that she is the only queen in w_7, and that she despises Torquemada but cherishes William Howley. Then (77f) – or, for that matter, (77d) – is true when assessed in the pair consisting of the actual context and w_7. It is therefore clear that these lexical entries do not capture the right truth-conditions of the sentence, for it should be false in w_7 regardless of the context in which it is being interpreted. Other theories, such as King's K1, are also subject to the very same problem.

Here is a possible response that could be sketched. Perhaps this is not a problem, for intensions are, after all, a technical device introduced for philosophical purposes. When it comes to assessing whether assertions made by average speakers in a random context *c* are true or false, all we usually need is to evaluate their content with respect to *c* and i_c. And it is clear that both (77d) and (77f) yield the right results if we restrict the evaluation of a sentence

in this manner. For any context *k*, assessing (77d) and (77f) in *k* and i_k will yield truth if and only if every queen in i_k cherishes the cleric that crowned her in i_k. And this is intuitively right.

This response, however, neglects many of the reasons why intensions were introduced in the first place. Intensions are artificial constructs, yet their purpose is to model concrete phenomena. More precisely, these constructs are supposed to model *content*, i.e., the object of assertion, what is said by a sentence in a context, the thought conveyed in a particular utterance. In our abstract models, intensions are what is asserted, believed, presupposed, asked and wondered about. This, in turn, means that they are also the object of intensional operators, such as attitude verbs. The above response therefore fails. Consider the following sentence:

(77g) John believes that every queen cherishes that cleric who crowned her

If we try assessing the truth of (77g) in a context *c* and a circumstance i_c, the result is still wrong: it will yield truth if and only if, in all circumstances *j* compatible with what John believes in i_c, every queen *x* in *j* cherishes $\delta_c(\lambda s.\ \lambda y.$ y is a cleric in s and y crowned x in s) (where "s" is another variable for circumstances). For each queen *x*, the property *λs. λy. y is a cleric in s and y crowned x in s* is taken as argument by δ_c, which in turn returns an individual that is a cleric and crowned *x* in the world and time of the context. But it is clear that John's belief should not involve just actual clerics. The above response disregarded the wrong predictions about intensionality on the basis that they are a mere technicality, but, insofar as we are working in a language with intensional operators, it ultimately fails. Similar problems occur with operators like the following:

(77h) It could have been the case that every queen cherished that cleric who crowned her

(77i) In the 18th century, every queen cherished that cleric who crowned her

Pretty much like the sentences above, (77h) will yield truth iff there is a possible world *w* such that every queen in *w* cherishes the cleric who crowned her in the actual world. (77i), on the other hand, is probably the clearest counterexample: assuming that "In the 18th century" shifts the time of evaluation to that period of time, this sentence will be true iff every queen in from the 18th century cherishes the *current* cleric who crowned her. These facts

show that the problem of intensional mismatch cannot be solved by always assessing sentences in the circumstance privileged by the context of utterance. On the contrary, they suggest that we should allow some occurrences of complex demonstratives to be circumstance-dependent rather than context-dependent. This idea is further reinforced by our intuitions towards NDNS-uses. The fact that c-theories and other Kaplan-inspired approaches are unable to count complex demonstratives as circumstance-dependent has been regarded as "the real limitation of the orthodox view" (Georgi 2012: 369).

The remainder of section 3.3 is devoted to solving the problem of intensional mismatch. The solution I will propose is a bit radical, but independently motivated and, in fact, standardly accepted ever since Cresswell's (1990) work on the expressive power of natural language: we need an explicit representation of worlds and times in the logical form of the sentences of our object language. This is what I set out to do in the following section, where, after briefly explaining the reasons usually adduced for this modification, I sketch a generic theory of verbal morphology and show how it solves the problem.

3.3.1.2 Natural language expressivity and quantification over times and worlds

The idea that we need a system with full object-language quantification over worlds and times is assumed by all standard theories of verbal morphology, notably the theories of tense (cf. Ogihara 1989, 1995, 1996; Enç 1987; Musan 1995; Kusumoto 1999; von Stechow 2003; Heim & von Fintel 2011, §8; Ogihara & Sharvit 2015). The reasons for this can be traced back to Cresswell's work and they are rather well-known among semanticists, but let me state them here just in order to remind the reader about them. Similar summaries can be found in Schlenker (2003a, section 3) and Rabern (2012b).

Classical intensional systems relativize the extension of expressions to just an intensional parameter. In standard possible world semantics, for example, expressions are assigned an extension relative to just one world (leaving aside irrelevant parameters such as models or assignments). Similarly, Arthur Prior's tense logic only requires an instant of time for determining the extension of an expression. It is clear, however, that these systems cannot

capture what is usually expressed by means of operators like "actually" and "now". Consider sentences like (19)-(20), repeated below:

(19) It is possible for everything that is *actually* red to be shiny

(20) Someday everyone *now* alive will be dead

Let me provide first-order translations of (19)-(20) in order to show this. For the sake of simplicity, let us momentarily leave aside GQ and treat quantification in the classical manner, by means of the Tarskian quantifiers "∃" and "∀". Additionally, let us adopt the necessity and possibility operators "□" and "◊" typical of modal logic, and let us capture (approximately) the meaning of "someday" by supplying our first-order version of tense logic with an operator "**S**" roughly analogous to the possibility operator: for every formula *p*, every time *t* and every assignment *g*, $[\![Sp]\!]^{g,\,t} = 1$ iff $[\exists t_2: t_2 > t]$ $([\![p]\!]^{g,\,t_2} = 1)$. Even after the adoption of these operators, (19) and (20) are not yet translatable into first-order modal and temporal logic, for we still need to find some way to express the meaning of "actually" and "now". One could try to do so, simply, by means of *scoping*: the predicates "red" and "alive" are supposed to be interpreted respectively as actual and current, and a natural way to try to achieve this is by letting these predicates take wide scope so that they are assessed in the initial world or time at which we are evaluating the whole sentence:

(19a) ∀x (Rx → ◊Sx) (where "R" and "S" stand, respectively, for "red" and "shiny")

(20a) ∀x (Ax → **S**Dx) (where "A" and "D" stand, respectively, for "alive" and "dead")

However, neither of these logical forms captures the meaning of the sentences they are intended to translate. Let us calculate the truth-conditions of (19) in an assignment *g* and possible world *w* which we may assume to be the actual one:

1. $[\![\forall x\ (Rx \rightarrow \Diamond Sx)]\!]^{g,\,w} = 1$ iff

2. $[\forall a: a \in U]$ $([\![Rx \rightarrow \Diamond Sx]\!]^{g(a/x),\,w} = 1)$ (where U is the domain of quantification and *g(a/x)* is the assignment function that is just like *g* except that it assigns *a* to "*x*") iff

3. $[\forall a: a \in U]$ (either $[\![Rx]\!]^{g(a/x),\,w} = 0$ or $[\![\Diamond Sx]\!]^{g(a/x),\,w} = 1$) iff

4. [∀a: a ∈ U] (either a is not red in w or there is a possible world w_2 accessible from w such that $[\![Sx]\!]^{g(a/x),\, w_2} = 1$) iff

5. [∀a: a ∈ U] (either a is not red in w or there is a possible world w_2 accessible from w such that a is shiny in w_2)

The truth-conditions arrived at in step 5 are wrong. Namely, they require that each of the things that are red in the initial world *w* be shiny in *some* possible world. But what (19) means is different: it should be true in case there is a possible world in which all the actual red things are *collectively* shiny. That is, we want to assign truth just in case all the objects that are red in the actual world are shiny together in a single world. Things are entirely analogous in the temporal domain: the logical form in (20a) is true just in case, for each person *x* currently alive, there is a time *t* such that *x* is dead, but, even though (20) can have such reading, its more straightforward meaning urges us to find a certain moment of time *t'* such that all the current living beings are *collectively* dead in *t'*.

Different scopings won't do either. For example, (19b)-(20b) and (19c)-(20c) are clearly wrong too:

(19b) ◊∀x (Rx → Sx)

(20b) **S**∀x (Ax → Dx)

(19c) ∀x ◊(Rx → Sx)

(20c) ∀x **S**(Ax → Dx)

(19b) requires there to be a possible world *w* such that everything that is red in *w* is shiny in *w*, i.e., it says nothing about the actual red things. (19c) makes a similar claim and, even though it may come closer to the meaning of (19) by restricting the claim to things that exist in the actual world, none of the things that are shiny in the second world are required to be red in the actual one. Analogous remarks hold for (20b-c). More generally, mere scoping is unable to capture the intended readings: we need "red" to be assessed according to the initial world of evaluation, meaning that it should take wide scope over the modal operator "it is possible", but at the same time "red" should be under the scope of the quantifier "everything", which in turn should be under the scope of "it is possible" in order for all the

actual red things to be collectively shiny at a single world. The required scoping differences are therefore incompatible. Similarly, (20) needs "alive" to take wide scope over the "someday" so that it can assessed at the initial time of evaluation, but it also needs "alive" to fall under the scope of "everyone". And the latter should, in turn, be under the scope of "someday" in order to capture the idea that all the current living beings are dead at a unique time. These requirements are mutually exclusive.

The usual solution to the problems in (19)-(20) is to translate "actually" and "now" as operators on their own (Prior 1968, Kamp 1971, Crossley & Humberstone 1977). Let "**A**" and "**N**" be such operators, and let (19)-(20) be translated thus:

(19d) $\Diamond\forall x$ (**A**Rx $\rightarrow$ Sx)

(20d) **S**$\forall x$ (**N**Ax $\rightarrow$ Dx)

But, of course, this solution is not just a matter of syntax. There is an important change we need to implement into the semantics: if we want **A** and **N** to be accurately interpreted, one of the possible worlds and one of the instants of time need to be designated, respectively, as the actual world and the current time. In other words, we need double indexing. Instead of assessing the truth of (19d) in a single world, we need to evaluate it in at least a pair of worlds $<w_1, w_2>$ such that the first member of the pair is designated as *actual*. The role of **A** is, simply, to equate the two parameters by replacing the second one with the first: for any *p*, *g* and $<w_1, w_2>$, $[\![\mathbf{A}p]\!]^{g, w_1, w_2} = 1$ iff $[\![p]\!]^{g, w_1, w_1} = 1$. It is easy to check that the truth-conditions of (19d) are accurate:

1. $[\![\Diamond\forall x$ (**A**Rx $\rightarrow$ Sx)$]\!]^{g, w_1, w_2} = 1$ iff

2. There is a possible world w_3 accessible from w_2 such that $[\![\forall x$ (**A**Rx $\rightarrow$ Sx)$]\!]^{g, w_1, w_3} = 1$ iff

3. There is a possible world w_3 accessible from w_2 such that [$\forall a$: $a \in$ U] ($[\![$(**A**Rx $\rightarrow$ Sx)$]\!]^{g(a/x), w_1, w_3} = 1$ iff

4. There is a possible world w_3 accessible from w_2 such that [$\forall a$: $a \in$ U] (either $[\![$**A**Rx$]\!]^{g(a/x), w_1, w_3} = 0$ or $[\![$Sx$]\!]^{g(a/x), w_1, w_3} = 1$) iff

5. There is a possible world w_3 accessible from w_2 such that [$\forall a$: $a \in$ U] (either $[\![Rx]\!]^{g(a/x),\, w_1,\, w_1} = 0$ or a is shiny in w_3) iff

6. There is a possible world w_3 accessible from w_2 such that [$\forall a$: $a \in$ U] (either a is not red in w_1 or a is shiny in w_3)

The functioning of "now" is entirely analogous. Of course, this machinery should be familiar to anyone who has worked with Kaplan's system, for the first world and time parameters are just playing the role of Kaplan's contexts: their only use is to provide the values for the indexical expressions "actually" and "now". The second parameter, in turn, can be equated with Kaplan's circumstances, for it is the parameter that the modal and temporal operators shift. By the same time Kaplan developed his LD, other authors were starting to explore the properties of doubly-indexed systems (cf. Kamp 1971, Segerberg 1973, Vlach 1973), which eventually became generalized and gave rise to what nowadays is known as "*two-dimensional semantics*".[74]

So far this is all compatible with the current framework. But the point of this section is to prove that this classical two-level picture is also insufficient. The main obstacle is that the very same problems of expressivity can be further reproduced by increasing sentential complexity. Take the following sentence (a slight variation of an example by Rabern (2012b)):

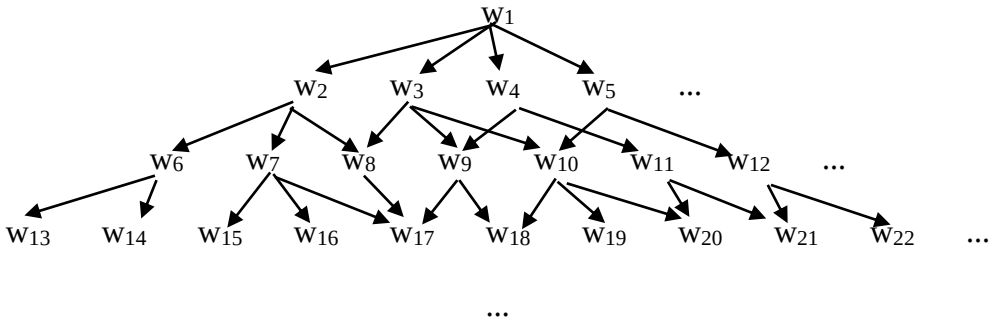
(157) If all the people who actually died on the maiden voyage of the Titanic had survived, it would still have been possible for everyone who would then have survived the maiden voyage to be severely harmed on the maiden voyage

In order to show that two worlds are insufficient for assessing this sentence, let me introduce a bit of vocabulary. (157) is a subjunctive conditional, i.e., its interpretation requires some sort of quantification over possible worlds. This is standardly tackled by means of the Lewis-Stalnaker semantics for counterfactuals (Stalnaker 1968, Lewis 1973), which introduces a connective "$\Box\!\!\rightarrow$" that is meant to translate subjunctive conditionals thus: any sentence of the form "if it were the case that *p*, then *q*" is translated into the formal language

[74] See the volume by García-Carpintero and Macià (2006) for an overview.

as "p□→q". The semantics for "□→" is a bit complex, but let me state it here, for it will be useful in the next section when I discuss sentences like (89). Essentially, any formula of the form "p□→q" is true in a random world *w* iff, for every world *w*' such that *w*' is among the worlds closest to *w* in which *p* holds, *q* is true in *w*'. The notion of "being among the worlds closest to *w*" deserves an explanation, and I provide it in the next paragraph.

Some possible worlds are more similar to ours than others. We can certainly assume that a world which is just like ours except that I am one centimeter shorter is more similar to the actual world than one in which the Roman Empire never existed. We can also imagine cases in which two worlds seem *prima facie* equally distant from the actual one; for example, it is unclear whether a world in which I am one centimeter taller is closer or farther from the actual world than one in which I am one centimeter shorter. In lack of a serious account of similarity we can assume, in general, that each world *w* determines a *similarity relation*, namely a partial ordering over a subset of all possible worlds. For example, given a certain world w_1, we could define the following relation R^{w_1}:



Of course, this is a totally random distribution of arrows. R^{w_1} can be understood as a reflexive, transitive and antisymmetric relation such that, for any two *w*, *w*', $<w, w'> \in R^{w_1}$ iff either *w* is more similar to w_1 than *w*' or *w* = *w'*. For example, $<w_1, w_2>$, $<w_2, w_{14}>$, $<w_1, w_{14}>$, $<w_1, w_1>$ and $<w_1, w_4>$ all belong to R^{w_1}, but $<w_9, w_1>$, $<w_3, w_4>$, $<w_4, w_{13}>$ and $<w_7, w_2>$ do not. Once a relation like R^{w_1} has been defined, it is possible to evaluate counterfactual claims in w_1. As stated above, "*p*□→*q*" is true in a world *w* iff, in all the worlds closest to *w* in which *p* is true, *q* is true. This means that this subjunctive conditional instructs us to construct a certain set of possible worlds, namely the set of worlds *w*' such that *p* is true in

w' and, for any *w*'' different from *w* or *w'* such that <*w*'', *w*'> ∈ R^w, *p* is not true in *w*''.[75] Call this set C^w(p). The formula "*p*□→*q*" is true in *w* iff *q* is true in every world belonging to C^w(p). In order to see how this works, consider the subjunctive conditional in (158a) and its translation into a suitable formula as in (158b) (where "R" means raining, "F" means playing football and "d" stands for Diego):

(158a) If it hadn't rained, Diego would have played football

(158b) ¬R □→ Fd

Let us assess (158b) in a pair of worlds <*w*, w_1>, where the similarity relation for w_1 is given in the above figure (*w* is irrelevant here, for (158b) does not contain any actuality operator). Assume, too, that the only worlds in which it is not raining are w_2, w_5, w_6, w_9, w_{12} and w_{17}; in that case, C^{w_1}(¬R) = {w_2, w_5, w_9}. Applying the above definition, we straightforwardly arrive at the right results: (158b) is true in the pair <*w*, w_1> iff the formula "Fd" is true in w_2, w_5 and w_9. Informally speaking, this semantics ensures that, if the conditional is true, every world in which it does not rain and yet Diego does not play football will be farther away from w_1 than those in which it does not rain and Diego does play. It is for this reason that the facts in other worlds in which it is also not raining, such as w_6, w_{12}, w_{17}, are irrelevant for the truth of the conditional.[76]

[75] Thanks to Jordi Valor for suggesting this formulation and for extensive discussion of certain inaccuracies that a previous version of this chapter contained. This way to characterize subjunctive conditionals is similar to Lewis's, but differs from it in important respects (see the next footnote). I chose to employ this simplified version for the sake of exposition.

[76] This is not exactly the way Lewis presents his semantics for counterfactuals. In his framework, each world *w* comes equipped with a system of spheres $\$^w$, which is a set of sets of possible worlds linearly ordered by the inclusion relation (i.e., for any two sets S_1 and S_2 in $\$^w$, either $S_1 \subseteq S_2$ or $S_2 \subseteq S_1$). Each sphere $S \in \$^w$ may be thought of as a degree in a scale of similarity, for it is a set containing all the worlds that are similar to *w* to at least certain extent. This means that each of the worlds within a sphere are more similar to *w* than those outside it: the smaller the sphere, the more similar to *w* it requires the worlds it contains to be. In his semantics, a formula like *p*□→*q* is true in *w* iff the material conditional *p*→*q* is true throughout all the worlds in the smallest sphere $S \in \$^w$ containing worlds in which *p* is true.
This is not exactly equivalent to the semantics I presented. Imagine, for instance, that the world w_1 in above example determines the following system of spheres: S_1 contains w_1, S_2 contains w_1, w_2, w_3, and w_4 and w_5, S_3 contains w_1 … w_{12}, and S_4 contains all possible worlds. Given that the smallest sphere containing worlds in which it is raining is S_2, the world w_9 becomes irrelevant for assessing the truth of (158b): it will be true iff ¬*R*→*Fd* is true in all the worlds in S_2, i.e., if Diego plays football in w_2 and w_5. I opted for a simplified semantics just for the sake of exposition.

We are now in a position to show that double-indexing is not sufficient for capturing the truth-conditions of (157). Let us first translate it into a suitable formula. The predicates "surviving the maiden voyage" and "dying on the maiden voyage" are mutually exclusive, so they may be translated as "S" and "¬S", respectively. Let also "H" stand for "being severely harmed". We may now attempt to translate (157) as one of the following:

(157a) $\forall x$ (**A**¬Sx → Sx) □→ ◊$\forall x$ (Sx → Hx))

(157b) $\forall x$ (**A**¬Sx → Sx) □→ $\forall x$ (Sx → ◊Hx))

But, as above, none of these captures the intuitive meaning of (157). Given a pair of possible worlds $<w_0, w_2>$ in which to assess these sentences, the first part of the conditional is interpreted in the same way in both (157a) and (157b): it instructs us to construct the set $C^{w_2}(\forall x$ (**A**¬Sx → Sx)), i.e., the set of worlds w_3 such that w_3 is among the closest-to-w_2 worlds such that all those who die in w_0 survive in w_3. The whole conditional is true iff the formula on the right side of the arrow is true in every world $w_3 \in C^{w_2}(\forall x$ (**A**¬Sx → Sx)). And this is, of course, the problematic part. For every world $w_3 \in C^{w_2}(\forall x$ (**A**¬Sx → Sx)), (157a) is true iff there is a world w_4 accessible from w_3 such that every survivor in w_4 is severely harmed in w_4 – i.e., it says nothing about the survivors in w_3. On the other hand, the truth of (157b) requires that, for every $w_3 \in C^{w_2}(\forall x$ (**A**¬Sx → Sx)), and for each of the survivors *x* in w_3, there is a possible world w_5 such that *x* is severely harmed in w_5. Thus, it only requires each of the survivors to be severely harmed in a possible world, but it says nothing about their collective fate – they need not be severely harmed together in a unique world. And, for the same reasons as above, scoping won't help.

The solution is to make "then" in (157) be translated as an operator whose behavior is very similar to "actually". Namely, this operator should be devised for selecting the worlds in the set $C^{w_2}(\forall x$ (**A**¬Sx → Sx)) and to assess "survive" in these worlds. But, again, this is not just a matter of syntax: in order to make it work, we need to relativize the truth of the sentence to at least three possible worlds. Things are not different in the temporal domain; for example, a correct assessment of the truth of (159) requires relativization to at least three instants of time (Cresswell 1990: 20):

(159) There will be times such that all persons now alive will be happy at the first or miserable at the second

Just as in the case of (157), double indexing is insufficient for assessing the truth of (159): we need there to be two times t_1 and t_2 occurring after the present time t_0 such that all those alive in t_2 are collectively happy in t_1 and collectively miserable in t_2. This means that we need triple indexing for both times and worlds. But, of course, this is not the end of the story: as sentential complexity increases, we need to relativize the semantic value of sentences to more and more parameters, eventually reaching an infinite number of times and worlds. The classical Kaplanian picture in which the semantic value of a sentence depends on just two possible worlds proved insufficient for sentences like (157) or (159), and a system with three levels is still not enough for capturing the whole expressive power of natural language.

Once these facts are acknowledged, there are two options at hand: either relativize the semantic value of sentences to an eventually infinite number of parameters, or to adopt a system with explicit world and time variables, i.e., to represent worlds and times directly into the logical form of sentences, instead of talking about them indirectly by means of operators. The differences between these two systems are mostly cosmetic,[77] but the second one is far more intuitive and simple; I shall therefore settle for it during the rest of this dissertation. In a system like this this one, world and time variables refer directly to possible worlds and instants of time, and they can be bound by quantifiers and lambda abstractors. Their functioning is, so to say, analogous to personal pronouns – which, as we have already mentioned, are usually modelled as variables in order to capture both their free and bound readings. Such system is indeed very reasonable, for, as arguments by Partee (1973) and Kratzer (1998a) made clear, verbal tense and mood behave, in important respects, just like other indexicals. The rest of this section is devoted to introducing the system I will be employing throughout the rest of this dissertation, in which tense and mood as understood as indexicals that contribute world and time variables to the sentences they appear in.

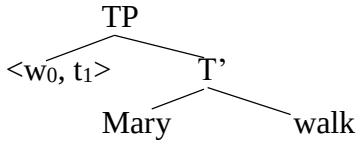
This dissertation is primarily concerned with complex demonstratives, so this is not the place to defend any particular approach to the semantics of tense and mood in general. Instead, let me sketch a very simple and fairly neutral theory of how these items work. In the

[77] It was Cresswell (1990) himself who proved the equivalence of these two systems.

first place, the syntax: let our language be equipped with infinitely many world variables w_0 … w_n …, and let it contain, too, infinitely many time variables t_0 ... t_n … Each of these is contributed to LF by some verbal morpheme (for the temporal and modal dependence of adjectives and common nouns, see below), and each sentence is fronted by a pair consisting of a world and a time variable. For instance, the LF of a sentence like (160) should look like (160a), where "TP" stands for "tensed phrase" and the variables "w_0" and "t_1" are contributed, respectively, by the indicative mood and present tense of the main verb, "walks":

(160) Mary walks

(160a)



An LF like this one is oversimplified and it sets aside a good deal of details, but these are not relevant for our present purposes, so let me adopt this model; in fact, and for typographical reasons, I will often be representing sentences by means of strings occupying a single line, thus:

(160a) <w_0, t_1> Mary walk

Let us now provide a semantics for (160a). In the first place, let me state the lexical entry for the world and time variables, which should be just like any other variable:

(161a) $[\![w_n]\!] = \lambda c.\ g_c(w_n)$, where *n* is any natural number

(161b) $[\![t_n]\!] = \lambda c.\ g_c(t_n)$, where *n* is any natural number

Of course, it should be a requirement that, for any natural number *m*, assignment *g* and variable of the form w_m, the value of w_m under *g* should be a world, and *mutatis mutandis* for time variables. On the other hand, the fact that this system represents world and time variables directly into the logical form of the sentences means that it is simpler to adopt a new type for predicates, namely <*h*, <*e*, <*s*, *t*>>>. Given a certain context, "walk" should combine first with "Mary" (type *e*) in order to return an intension, namely the proposition that Mary walks (of type <*s*, *t*>). This proposition, in turn, combines with the upper node containing the time

and world variables, i.e., with a circumstance of type *s*, with the result that (160a) is true under an assignment function *g* iff Mary walks at the circumstance $<g(w_0), g(t_1)>$.

This, in turn, requires some further adjustments. Notice in the first place that, in a setting like the one I just sketched, relativization to circumstances is entirely vacuous, for sentences already incorporate reference to a possible world and an instant of time in their logical forms. The semantic value of sentences depends, among others, on a circumstance, but this circumstance is already mentioned in the syntax and it is therefore entirely unnecessary to include another one among the evaluation parameters. Once we adopt a system with explicit world and time variables, the natural and common option is to drop circumstances and to relativize the extension of sentences to just a context – as the lexical entries for variables in (161) already do. And, of course, we need to work with a new version of FA ensuring that the combination described in the previous paragraph can go through:

> FUNCTIONAL APPLICATION (FA): If α is a branching node and {β, γ} the set of its daughters, then α is in the domain of $[\![\ ]\!]^c$ if both β and γ are and $[\![\beta]\!]^c$ is a function whose domain contains $[\![\gamma]\!]^c$. In that case, $[\![\alpha]\!]^c = [\![\beta]\!]^c([\![\gamma]\!]^c)$.

In turn, this entails slightly modifying our lexical entries in general, because they are now simpler. Here is, for example, the lexical entry for "I":

$[\![I]\!] = \lambda c.\ a_c$

Most of our lexical entries, however, remain almost unaltered. For example, an adjective like "green" still requires filling by a circumstance, although its type should be modified in the same fashion as the verb "walk":

$[\![green]\!] = \lambda c.\ \lambda x.\ \lambda i.$ x is green in i

The main difference is, of course, that the circumstance is explicitly mentioned in the LF of the sentence "green" appears in, instead of being placed among the evaluation parameters. Lexical items such as common nouns or tenseless verbs receive exactly the same type of denotation as adjectives. On the other hand, notice that our lexical entry for complex demonstratives, (147), is devised for predicates of the old type. Adopting a new type means that (147) should be modified accordingly. Here is the straightforward modification:

(147e) $\lambda c.\ \lambda P_{<e,\ <s,\ t>>}.\ \delta_c(P)$

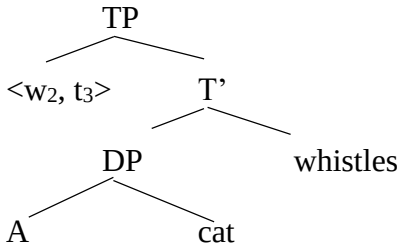
Of course, this in turn requires slightly altering the requirement that the δ function is supposed to meet. Namely, for each context *c*, δ_c should be defined as a function δ_c: Π→E such that, for any P ∈ Π, $P(\delta_c(P))(i_c) = 1$. This is so because the properties in Π now combine first with individuals and only later with circumstances. Another adjustment that we need is, of course, a new type for determiners other than "that". The type they need given this system is a very complex one: <*h*, <<*e*, <*s*, *t*>>, <<*e*, <*s*, *t*>>, <*s*, *t*>>>>. I.e., given a context they combine with two predicates, then with a circumstance and finally they return a truth-value. Let us provide a semantics for a simple determiner, "a":

(162) $\lambda c.\ \lambda P_{<e,\ <s,\ t>>}.\ \lambda Q_{<e,\ <s,\ t>>}.\ \lambda i.\ \exists x\ (P(x)(i) = 1\ \&\ Q(x)(i) = 1)$

Let me show how it works by means of an example:

(163a) A cat whistles

(163b)



Given a certain context *c*, (163b) receives the following interpretation. The predicate "cat", of type <*h*, <*e*, <*s*, *t*>>>, fills the first slot of "a", yielding the quantifier "a cat". This quantifier combines with "whistle", also of type <*h*, <*e*, <*s*, *t*>>>, and it returns a function from circumstances to truth values: namely, the function λi. ∃x (x is a cat in i & x whistles in i). Then the circumstance slot is filled with the above variables, thus returning truth under an assignment *g* just in case ∃x (x is a cat in $<g(w_2), g(t_3)>$ & x whistles in $<g(w_2), g(t_3)>$). Other determiners should be treated in an analogous way.

Further adjustments are required. Notice, in the first place, that the semantics in (161a-b) is still not enough for capturing all the semantically relevant properties of tense and mood. These variables are contributed by verbs, and each of them picks out a world or a time, but

the lexical entries in (161a-b) are still silent about *which kind of worlds and which kind of times* should be picked out by each variable. Namely, those entries are still unable to distinguish between, say, past and present, or subjunctive and indicative. The usual way to do this is to define a semantics for present and indicative, and then define the other tenses and moods in relation to it – say, to define the future as an existential quantifier ranging over tenses occurring after the present tense. Since I am modelling indicative and present as indexicals, these two should pick out, respectively, w_c and t_c, for every context *c*. This can be achieved in the following manner. Syntactically, indicative mood and present tense should contribute to LF, respectively, the variables "w_n^{ind}" and "t_m^{pres}", for some natural numbers n and m. This means that their contribution is not just a variable, but rather a variable marked with some features (cf. von Stechow 2003, 2004). And then these features can be given the following presuppositional semantics:

(161c) $[\![w_n^{ind}]\!] = \lambda c: g_c(w_n) = w_c.\ g_c(w_n)$, where *n* is any natural number

(161d) $[\![t_n^{pres}]\!] = \lambda c: g_c(t_n) = t_c.\ g_c(t_n)$, where *n* is any natural number

For the record, this is analogous to the way "he" or "she" are defined. The features of these pronouns restrict the set of assignments that can be used for giving a value to the variables that they contribute, thus ensuring that they will be respectively assigned a male and a female. The features of present and indicative, in turn, restrict the assignments in a similar fashion, thus ensuring that their associated variables will always pick out the time and world of the context. In particular, the following two sentences mean exactly the same in any context:

(164a) I am tired

(164b) I am actually tired now

If you are worried that this semantics is in conflict with many of the basic tenets of Kaplanian frameworks, wait for the discussion in section 3.3.5.2. As we shall see, there is an elegant and intuitive way to compatibilize this semantics with the idea that (164a), but not (164b), should be affected by intensional operators.

As stated above, all the other tenses and moods are usually defined in relation to the two basic ones. For example, it is usual to treat past tense as expressing a relation to present tense: a sentence like "Mary walked" is true in a context *c* iff there is a time *t* such that *t* occurs before t_c and Mary walks at *t*. This means that past morphemes can be modeled as object-language existential quantifiers whose domain of quantification is restricted to times occurring before the present tense; for example, the LF of "Mary walked" should look like this:

(160c) $[\exists t_1: t_1 < t_0^{pres}]$ ($<w_2^{ind}, t_1>$ Mary walk)

Giving their obvious semantics to newly introduced the lexical items in (160c) yields the right results: (160c) is true in any context *c* such that there is a time *t* occurring before t_c and Mary walks at $<w_c, t>$. Things are similar for other tenses. For example, "will" is defined in exactly the same way, but with an opposite presupposition: namely, the domain of quantification of the existential quantifier should be restricted to times taking place after the time of the context. An important consequence of this semantics is that, regardless of the tense of the main verb, every sentence will contain a variable with the present feature explicitly represented at LF. This will be important for stating some important tenets of my semantics.

This, in turn, means that there is an important disanalogy between present, on the one hand, and present and past, on the other. Namely, present is referential, whereas the other two tenses are quantificational. But some authors, most notably Partee (1973), have questioned this disanalogy. The most famous example in this discussion concerns past, and it is due to Partee herself:

(165) I didn't turn off the stove

The idea that the past tense in (165) is quantificational is in conflict with the intuitive truth-conditions of this sentence. If it were quantificational, then (165) should mean either there is a moment *t* such that I did not turn off the stove in *t* (which is trivially true) or that no past moment *t*' is such that I turned off the stove in *t*' (i.e., that never in my life have I turned it off). But (165) seems to state something different: rather, it is saying that, at a specific moment *t*'', I did not turn off the stove. I.e., the past tense in this sentence appears to be referential. Namely, the anteriority with respect to the present tense seems to be

presupposed, rather than asserted, and this suggests that its meaning is probably more accurately captured by the following LF and truth conditions (omitting modal dependence for simplicity's sake):

(165a) t_0^{past} [$t_0 < t_1^{pres}$] ¬ (I turn off the stove)

(165b) λc: $g_c(t_0) < g_c(t_1)$ & $g_c(t_1) = t_c$. a_c turns off the stove in $g_c(t_0)$

These subtleties, however, are orthogonal to our purposes. As the above logical form shows, having a referential semantics for past tense does not entail that logical forms need not represent the present tense; rather, this is required in order to ensure that the presuppositional material receives the right interpretation. Let me therefore ignore the facts about (165) and work, simply, with (161c-d), i.e., let me treat any tense and mood different from present and indicative as quantificational rather than referential.

Up until now we have been talking about world and time variables contributed by verbs. However, verbs denote properties, so one might wonder whether adjectives should be paired with circumstance variables too. After all, their extension also depends on circumstances: the set of individuals satisfying "green" varies depending on the world and time in which we are assessing the predicate. In fact, pairing adjectives with circumstance variables is a very common solution for some classic puzzles in semantics, notably the so-called "Fodor readings".[78] Systems in which adjectives and verbs are on a par have been developed, for example by Mürvet Enç (1987). I do not think, however, that this is an appropriate solution. English adjectives have no overt tense nor mood, and therefore they

[78] The name is due to Janet Fodor (1970). Her paradigmatic example concerns the following sentence:

(m) Mary wants to buy a hat just like mine

Sentence (m) displays the usual scope ambiguities. If read *de re*, it means that there is a certain hat that Mary intends to buy and that happens to be identical to mine, a fact Mary may be unaware of; the *de dicto* reading, on the other hand, means that Mary wants to buy any hat as long as it is just like mine. There is nevertheless yet another possible reading, which Fodor dubs "*non-specific de re*": Mary wants to buy any hat whatsoever, as long as it satisfies a certain condition (say, being a fedora hat). Unbeknownst to Mary, my hat satisfies that very same condition. In other words, the property attributed to the hat, "being just like mine", is read *de re* (my hat need not be like Mary's in each of the circumstances compatible with her wish), but on the other hand the quantifier "a hat" also takes narrow scope, for Mary's wish is not about any particular hat.

A common solution to the problem is to posit overt world variables for "mine" (in all the circumstances compatible with Mary's wish, she buys a hat that it just like my *actual* hat), although other authors have resorted to scoping with higher-order variables. See Heim & von Fintel (2011, §8) for an overview. I am sympathetic to the idea of trying to solve the problem by means of scoping.

make no explicit reference to worlds and times. This means that any variable contributed by them would have the status of a hidden argument, i.e., one that needs an important amount of justification in order not to count as *ad hoc*. By adding these variables into the LF of sentences, we lose the correspondence between what we superficially hear and see and what we semantically interpret (Kusumoto 1999). But, additionally, arguments by Renate Musan (1995) and Kiyomi Kusumoto (1999) made clear that such systems often overgenerate when it comes to the possible readings of sentences containing both verbs and adjectives. I will therefore not be including any variables that are not contributed by some explicit element of the sentence. Instead, the required readings should be obtained differently. Let us see how.

As I mentioned above, the variables contributed by the verbs are not in a node that is sister to the verb itself. This is clearly shown in (160a), where the sister to the variables is not "walk", but "Mary walk" – this is also a consequence of adopting our new type for predicates. World and time variables are sisters to *clauses*, and this means that adjectives will normally be interpreted according to the tense of the verb of the clause they are inserted in. Consider the following sentence and its LF:

(163c) A black cat whistled

(163d) $[\exists t_1\text{: } t_1 < t_0^{pres}]$ $(<w_2^{ind}, t_1>$ [A black cat] whistle)

As it is standard (Heim & Kratzer 1998: §4), "black" and "cat" combine together in order to obtain a complex predicate "black cat". This is achieved by means of the Predicate Modification Rule (Heim & Kratzer 1998: 65), which should be added to our inventory of rules of semantic combination together with FA. Disregarding context-dependence, it may be stated thus:

PREDICATE MODIFICATION (PM):

If α is a branching node and β and γ its daughters, and β denotes a function *f* of type <*e*, <*s*, *t*>> and γ a function *g* of type <*e*, <*s*, *t*>>, then α denotes a function *h* of type <*e*, <*s*, *t*>> such that for all <*w*, *t*> ∈ S and *x* ∈ E, *h*(*x*)(<*w*, *t*>) = 1 iff *f*(*x*)(<*w*, *t*>) = 1 and *g*(*x*)(<*w*, *t*>) = 1 (where S and E are, respectively, the set of all circumstances and the set of all individuals).

This rule allows any two predicates of the same type, like "black" and "cat", to combine into a single predicate of the same type, "black cat", whose denotation is a combination of both predicates. Thus, if "black" denotes the function λx. λi. x is black in i, and "cat" denotes λx. λi. x is a cat in i, then the node "black cat" will denote λx. λi. x is a cat in i and x is black in i. This means that "black cat" in (163c) has exactly the same status as "cat" in (163a): it is, simply, a predicate. It is straightforward that, given the semantics that we have provided for the determiner in (162), "black cat" (and therefore "black") will be interpreted according to the tense contributed by the verb "whistle". In other words, the cat will have to be black while it whistles. Other readings may be obtained by means of scoping.

This leads me to the final adjustment, which concerns mainly relative clauses. This kind of clauses are usually formed by means of relative pronouns like "who", "that" or "which", and these are normally interpreted as object-language lambda abstractors that turn sentences into predicates by binding a trace internal to the clause. For example, the relative clause "who wears glasses" in the DP "a woman who wears glasses" would receive a logical form like the following (a final notational remark: it is usual to represent movement traces by means of the letter "t", but in order to avoid confusion with time variables I will be using $r_1 \ldots r_n \ldots$ instead):

(166) $\text{who}_1 <w_2, t_3> r_1$ wears glasses

As stated above, "who_1" has the same semantics as a lambda abstractor like "λ1". This means that, when interpreted under an assignment *g*, (166) denotes the function λx. x wears glasses in $<g(w_2), g(t_3)>$. Now consider sentence (167) and its LF (167a):

(167) Mary loves a woman who wears glasses

(167a) $<w_0^{ind}, t_1^{pres}>$ [A woman $\text{who}_2 <w_3^{ind}, t_4^{pres}> r_2$ wears glasses] λ5. Mary loves r_5

In systems with no world and time variables in the object-language, relative clauses combine with adjectives by means of PM: since "woman" and "who wears glasses" are of the same type, their combination would denote the function λx. x is a woman and x wears glasses. However, this is not possible in (167a), for, in our system, "woman" and "who wears glasses" do not have the same type: the former is *<e, <s, t>>*, whereas the latter is already

tensed, meaning that it is of type <*e*, *t*>. This means that we need an additional rule. Following Kusumoto (1999), who in turn follows Kratzer 1994a, 1994b), we may state it thus (setting context-dependence aside):

INDIVIDUAL IDENTIFICATION:

If α is a branching node and β and γ its daughters, and β denotes a function *f* of type <*e*, <*s*, *t*>> and γ a function *g* of type <*e*, *t*>, then α denotes a function *h* of type <*e*, <*s*, *t*>> such that, for all <*w*, *t*> ∈ S and *x* ∈ E, *h*(*x*)(<*w*, *t*>) = 1 iff *f*(*x*)(<*w*, *t*>) = 1 and *g*(*x*) = 1.

This principle will ensure that adjectives and common nouns will be able to combine with tensed predicates. So far the basics of a theory of tense and mood; this approach is incomplete, oversimplified and most probably inaccurate in many respects, but it follows the standard fairly well, and as I stated above this is not the place to defend any particular theory. What matters now is that we already have the tools for solving the problem of QI.

3.3.1.3 Two solutions to the problem of intensional mismatch

The changes implemented in the above section were radical, but I hope to have convinced the reader that they were independently justified, required in order to account for the whole expressive power of natural language. What matters now is that, after having implemented these changes, which were anyway necessary, we are finally in a position to make the right predictions concerning QI-uses, and to solve what I called "the problem of intensional mismatch". Namely, I discuss two possible solutions to the problem, which I shall dub the "extensional solution" and the "circumstance-binding solution". Let us see what they consist of.

The extensional solution was already strongly implied in the discussion from the last section. As already mentioned, relativization to circumstances is entirely vacuous in a system like the one just sketched. Once we have dropped circumstances from the parameters of evaluation, the problem of intensional mismatch simply vanishes: it makes no sense to wonder whether the intension expressed by (77) would have been true at some other

circumstance, for it is not relative to circumstances, only to contexts. Namely, (77) should receive the (simplified) LF in (77j) below, and the truth-conditions in (77k):

(77j) $<w_0^{ind}, t_1^{pres}>$ [Every queen] $\lambda 2.\ r_2$ cherishes that cleric who$_6$ [$\exists t_5: t_5 < t_4^{pres}$] ($<w_3^{ind}, t_5>$ r_6 crown her$_2$)

(77k) λc: $g_c(w_0) = w_c$ & $g_c(t_1) = t_c$ & $g_c(w_3) = w_c$ & $g_c(t_4) = t_c$. $\forall x$ (x is a queen in $<g_c(w_0), g_c(t_1)> \rightarrow$ x cherishes $\underline{\delta_c(\lambda z.\ \lambda i.\ z \text{ is a cleric in } i \ \&\ \exists t\ (t < g_c(t_4)\ \&\ z \text{ crowns x in } <g_c(w_3), t>))}$ in $<g_c(w_0), g_c(t_1)>$)

Of course, (77k) requires, for each queen x, that $\delta_c(\lambda z.\ \lambda i.\ z$ *is a cleric in* $i\ \&\ \exists t\ (t < g_c(t_4)\ \&\ z$ *crowns x in* $<g_c(w_3), t>))$ instantiates the properties of being a cleric in w_c and t_c and having crowned x at w_c and an instant of time t occurring before t_c. The problem is now solved: (77k) treats the complex demonstrative as a context-dependent singular term (type *e*) that nevertheless fails to pick out a unique individual, for it determines a different one for each queen. In addition, there is no possibility that the properties "queen" and "cleric who crowned her" be assessed at different worlds or times: for any assignment g, the extension of these two predicates will have to be calculated, respectively, in the circumstances $<g(w_0), g(t_1)>$ and $<g(w_3), g(t_4)>$, under the presupposition that, at any context *c* in which (77k) is interpretable, $g_c(w_0) = g_c(w_3) = w_c$ and $g_c(t_1) = g(t_4) = t_c$. Since these two predicates cannot fall apart intensionally, the problem of intensional mismatch is solved. Let's call this the '*extensional solution*'. This also applies to (78)-(81); I shall discuss each of these below (for those of you concerned about how the extensional solution handles attitude reports, do not be impatient: I address these worries in section 3.3.5.2).

The extensional solution is my favorite option for handling the problem of QI. However, those willing to preserve intensions might not be entirely happy with this solution. Since I am confronting directly many authors who advocate intensions or, almost equivalently, structured propositions, I will adapt my solution to an intensional setting[79] and,

[79] One might worry that re-introducing intensions might be in conflict with the above discussion on the expressive power of natural language, for it seems incompatible with adopting a Kaplan-style system that relativizes extensions to just two parameters. However, such concern is actually just a matter of formalism: all it means is, simply, that sentences are much more context-dependent than in Kaplan's system, i.e., that the context should settle the value of far more variables than Kaplan thought. In the current system, all that is required is that the assignment function provides values to an infinity of world and time variables.

once the two solutions have been explicitly stated, I will be apply them case by case to all the counterexamples from section 2.2.1.2. There are many ways to preserve intensions in a system with explicit world and time variables. One option is to let the variables marked with "ind" and "pres" pick out the time and world of the circumstance instead of the one of the context. Another possibility is to let every sentence be fronted by a lambda binding the indicative and present variables in it, as in Heim and von Fintel's (2011) handbook. This is the option I will be adopting throughout the rest of this dissertation.

Let us see an example. If we want (167) to express an intension and yet have an LF where tense and mood are explicitly represented, we need two things. First, every world variable contributed by indicative mood should be co-indexed,[80] and *mutatis mutandis* for the time variables contributed by present tense. In addition, it should be a syntactic requirement of sentences that they should be fronted by a lambda binding these variables, as in (167b) below. Of course, the presuppositional semantics for "pres" and "ind" that we stated above becomes unnecessary in this system, so we may just omit these features:

> (167b) $\lambda<w_1, t_2>. <w_1, t_2>$ [A woman who$_4$ $<w_1, t_2>$ r_4 wears glasses] $\lambda 3$. Mary loves r_3

Thus, the idea is to see whether there is a woman who wears glasses in $g(w_1)$ and $g(t_2)$ and who is loved by Mary in the very same world and time, and then to abstract over these two parameters. Since these become irrelevant, what we get is something that can be true or false depending on different circumstances. In other words, a sentence like (167b) expresses an intension, and more concretely a proposition. This proposition, of course, needs to be feed with a possible world and a time in order to get a truth-value, and this means that our system needs to re-introduce circumstances of evaluation: $[\![(167b)]\!]^{c, i} = 1$ iff there is an *x* in i such that *x* is a woman in i, *x* wears glasses in i and Mary loves *x* in i. Let us see the predictions that this system makes about QI sentences.

---

[80] Co-indexing is necessary in this system, for otherwise we could end up attributing to (167) a reading it does not have. There are alternatives, however. For example, the same results can be achieved by fronting every sentence with two variables 'w_0, t_0' which always pick out the parameters of the circumstance, and by letting any variable marked with the indicative have the following presuppositional semantics:

$[\![w_n^{ind}]\!] = \lambda c: g_c(w_n) = g_c(w_0). \lambda i. g_c(w_n)$, where *n* is any natural number

$[\![t_n^{pres}]\!] = \lambda c: g_c(t_n) = g_c(t_0). \lambda i. g_c(t_n)$, where *n* is any natural number

I will resort to co-indexing for simplicity's sake.

Notice that, in a system like this one, the complex demonstrative in (77) is an indexical singular term, but nevertheless it comes out as *circumstance-dependent*. Namely, the quantification into the complex demonstrative is threefold: it contains a bound pronoun ("her") and two extra variables, one for times and another one for worlds, that are also externally bound. This is the new LF:

(77l) $\lambda<w_0, t_1>. <w_0, t_1>$ [Every queen] $\lambda 2. r_2$ cherishes that cleric who$_4$ [$\exists t_3$: $t_3 < t_1$] ($<w_0, t_3> r_4$ crown her$_2$)

This yields an interesting result: no matter what context you provide for interpreting (77l), the extension of the complex demonstrative still depends on the circumstance. More generally, any complex demonstrative containing a tensed verb will come out as circumstance-dependent. Namely, this is the intension expressed by (77l) in context *c*:

(77m) $\lambda i. \forall x$ (x is a queen in $i \rightarrow$ x cherishes $\underline{\delta_c(\lambda y. \lambda j.}$ $\underline{y \text{ is a cleric in } j \text{ and there is a time } t \text{ such that } t \text{ occurs before } t_i \text{ and } y \text{ crowns } x \text{ in } <w_i, t>)}$ in i)

These truth-conditions require whoever is selected by the complex demonstrative to perform the crowning at the world of the circumstance of evaluation and a time previous to that of the circumstance. These are, too, the parameters at which we assess "queen". Thus, this system makes a curious prediction: whenever the complex demonstrative contains a tensed verb, its extension will depend on the world and time of the circumstance of evaluation. By contrast, complex demonstratives without any explicit reference to worlds and times, like "that woman", will always pick out a referent from the context. This prediction may look strange, but actually it fits very nicely with a pattern of use of complex demonstratives noted by Wolter (2006) and further expanded on by Nowak (2019a), which I shall discuss by the end of this section. But notice, first, that (77m) is still not entirely accurate.

The trouble with (77m) is that it reproduces a version of the problem of intensional mismatch: it is true in a context *c* and circumstance *i* iff every queen in *i* cherishes a certain object that crowned her in *i* and is a cleric in i_c. The problem of intensional mismatch persists, for "cleric" still depends on the context. We should be able to coordinate it with the world and time variables contributed by "crowned". Let us see how this can be done. Notice that

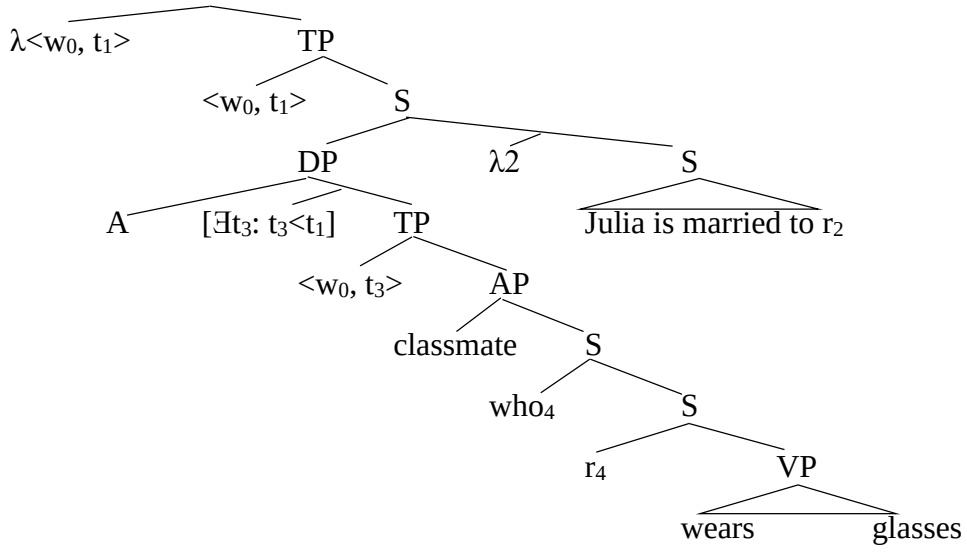
this problem is not unique to complex demonstratives: the combination of nouns and relative clauses is often tricky. Consider (168):

(168) Julia is married to a fellow classmate who used to wear glasses

This sentence has two readings. On one of them, Julia and her wife are currently classmates, and the latter used to wear glasses in the past, perhaps when they had not even met. On the other, Julia is married to a former classmate who wore glasses back when they were students, but not anymore.[81] Thus, "classmate" can be simultaneous either with the marriage, in which case it should be interpreted according to the time of the main clause, or with the wearing of the glasses, in which case it must be saturated with the tense of the relative clause. If we can find a way to achieve the latter reading, the very same solution can be employed for solving this version of the problem of intensional mismatch.

There are many possible ways to predict the two readings that (168), or for that matter (77m), displays, although none of them are devoid of problems. The first solution to come to one's mind is to say that the time and world variables contributed by the embedded verb can optionally raise over the adjective, thus:

(168a)



[81] Admittedly, the latter reading is harder to achieve, but it can be made perfectly felicitous, and even preferred to the former one, if some context is provided. Imagine you and me have been classmates to Julia, and we are having a conversation remembering past times. If I utter (168) in this context, the second reading is more salient.

Assume that "used to" is translated as an existential quantifier over past times, as above. As the tree shows, the tense is moved outside the relative clause and attached as a sister of the adjectival phrase containing the predicate "classmate". Thus, the latter falls under the scope of the existential quantifier, and therefore the required reading is obtained: (168a) requires "classmate" and "wearing glasses" to be coordinated. These two predicates are in sister nodes, and they are of the same type, and they can therefore combine together by PREDICATE MODIFICATION to generate the complex predicate "classmate who wears glasses", which in turn can be saturated by the tense and mood above them. The same solution could in principle be applied to the predicates "cleric" and "who crowned her" in (77l). One could simply extract the tense and mood from the relative clause and move them in front of the adjective so that the latter can be interpreted appropriately.

This solution could *prima facie* work, but it is at odds with an important idea in contemporary linguistics. It is well-known since the work of John Ross (1967) that relative clauses are *movement islands*, i.e., syntactic structures that, in terms of movement, are isolated from the rest of the sentence they are embedded in. This means that, if we are to apply movement rules to elements within a relative clause, movement is limited to the clause itself. For example, wh-movement, usually a perfectly felicitous operation, results in ungrammaticality when it involves moving an element outside a relative clause:

(169) John eats what → ^{OK} What does John eat ___?

(168b) Julia is married to a fellow classmate who wears what → #<u>What</u> is Julia married to a fellow classmate who wears __?

The above solution involves extracting tenses and moods from a relative clause, which should in principle be disallowed by Ross's constraints. The idea is therefore not entirely satisfactory. Besides, it does not fit the new types that we posited for predicates.

It is also possible to adopt the opposite option: perhaps it could be argued that the tense and mood of the verb remain where they are but the predicate "classmate" is *lowered* into the relative clause. This idea could find some support on May's (1977, 1985) ideas on quantifier

raising, which, he argued, could also occur in a downward fashion.[82] This idea, however, is not as uncontroversial as QR; Chomsky, for example, found it dubious (1995/2015: 300-301).

A third possibility is to adopt explicit world and time variables not just for verbs but also for adjectives and common nouns. We could give to (168) an LF like the following, in which the variables are not attached to the sentence but rather to each of the predicates:

(168c) [A classmate(w_3^{ind}, t_1) who$_4$ (r_4 wear(w_7^{ind}, t_2^{past}) glasses)] λ6. Julia is married (w_9^{ind}, t_5^{pres}) to r_6

And then we could specify a clause to the effect that the variables contributed by adjectives and common nouns must be co-referential with some variable contributed by a verb; thus, for example, the variable contributed by "classmate" should be coordinated with either the one attached to "is married" or the one contributed by "wears". The problem of this solution is that, unless we find some independent justification for it, it seems entirely *ad hoc*, for these variables have no reflection on the superficial form of the sentences of our language. Besides, as we have already mentioned, these systems often overgenerate. Notice, for example, that not all predicates in (168c) have a variable attached; "glasses" still lacks one. And, in principle, nothing could prevent this variable from being coordinated with "is married" instead of "wears". This would predict that (168c) has a reading according to which Julia's wife used to wear an *x* such that *x* are glasses by the time of the marriage but perhaps not when she wore *x*. For these reasons, I believe we should prefer theories that only allow variables that are explicitly mentioned in the sentence.

There are many other possible solutions. We could, for example, try to implement a system like Musan's (1995), in which the temporal interpretation of a DP depends on the determiner itself. Thus, "that" could perform some kind of quantification over times and worlds that would account for the temporal dependence of the predicates it combines with. A fifth possibility is to come up with some syntactic story according to which "that cleric"

[82] This is, in fact, what *prima facie* appears to be going on in sentences like (3)-(4), repeated below:

(3) The first man in space could have been American

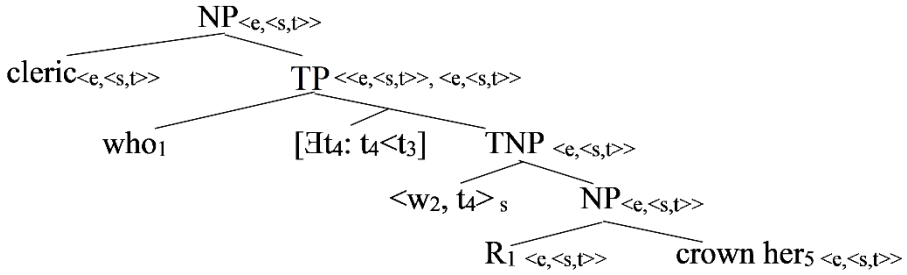
(4) The president of China will visit Japan

In these examples, the quantifier is superficially higher than the intensional operators "could" and "will". It seems, then, that the superficial form reflects the *de re* reading, whereas the *de dicto* one could be obtained by lowering the quantifier.

or “a fellow classmate” start out as the respective subjects of the relative clauses they are modified by and they are moved later on, leaving a trace within the embedded clause that would combine with the tenses above it.

I do not intend to vindicate any of these solutions; all of them could work pretty well in most cases, and all of them surely have their own problems. I will be adopting a different and simpler approach throughout this dissertation, although any of the ones above could be adapted to my system. My solution yields the right predictions about both (77) and (168), and it has to do with the relative pronoun “who”. As we mentioned above, this expression is usually treated as an object-language lambda abstractor that binds an *e* type variable within the relative clause;[83] namely, it binds a trace generated by movement. I see no obstacle to saying that this variable can optionally be of a different type; in particular, the type I wish to attribute to this trace is that of predicates: <*e*, <*s*, *t*>>. This means that “who” should able to bind variables for properties. Here is the tree I am proposing, and that I explain below (every node has its type annotated):

(170)



And here is the explanation of how (170) works. “R_1” is a trace that is interpreted as a predicate variable, and its node is a sister to “crown her$_5$”. Since both of them are of the same type, they can combine by PREDICATE MODIFICATION to obtain a complex predicate with the meaning *λx. λi. g(R_1)(x)(i) = 1 & x crowns g(5) in i*, for some assignment g. This is the function denoted by the lowest “NP” node. This node, in turn, is sister to the one containing the time and world variables, and this is quite inconvenient, for predicates require

[83] Other authors prefer to treat it as a semantically vacuous expression and to add the lambda as a covert element within the relative clause itself. I see no real difference between these two approaches, and my proposal is compatible with both of them.

a sister containing an individual. This is something that could be straightforwardly solved if we adopted our previous type <*s*, <*e*, *t*>> for predicates, although this would entail complicating our semantics in general. Instead, let me adopt the following fairly reasonable combination principle:[84]

CIRCUMSTANCE SPECIFICATION:

If α is a branching node and β and γ its daughters, and β denotes a function *f* of type <*e*, <*s*, *t*>> and γ a circumstance *i* (type *s*), then α denotes a function *h* of type <*e*, <*s*, *t*>> such that for all <*w*, *t*> ∈ D_s and *x* ∈ D_e, *h*(*x*)(<*w*, *t*>) = 1 iff *f*(*x*)(*i*) = 1

This principle allows the lowest NP in (170) to be saturated by its sister node: for some assignment *g*, the combination of *λx. λi. g(R₁)(x)(i) = 1 & x crowns g(5) in i* and the circumstance <g(w_2), g(t_4)> yields, as a result, the following tensed predicate: *λx. λi. g(R₁)(x)(<g(w₂), g(t₄)>) = 1 & x crowns g(5) in <g(w₂), g(t₄)>*. This predicate is also of type <*e*, <*s*, *t*>>, but it is not actually sensitive to circumstances: it denotes, for any assignment *g*, the set of individuals *x* such that *x* crowned g(5) at the circumstance <g(w_2), g(t_4)> and *x* has the property g(R_1) at the very same circumstance. In the next step, the existential quantifier contributed by the past tense binds the time variable g(t_4).[85]

The following step is the most important one, for here the modified tensed predicate combines with "who$_1$", which binds the predicate variable "R_1", resulting in a function from predicates to predicates: *λP. λx. λi. ∃t (t occurs before g(t₃) & P(x)(<g(w₂), t>) = 1 & x crowns g(5) in <g(w₂), t>*. This function, in turn, combines with the predicate "cleric", yielding the desired result: the top-most node denotes the function *λx. λi. ∃t (t occurs before g(t₄) & x is a cleric in <g(w₂), t> & x crowns g(5) in <g(w₂), t>)*. The latter function is also of type <*e*, <*s*, *t*>>, but, as above, it is not sensitive to circumstances. This means that (170)

[84] Some philosophers may be reluctant to adopting yet another composition principle. Notice, however, CIRCUMSTANCE SPECIFICATION is complementary to INDIVIDUAL IDENTIFICATION above, meaning that it does not come at a greater conceptual cost. Namely, the latter principle allows expressions of type <e, <s, t>> to combine with others of type <e, t>, whereas the former allows combinations of <e, <s, t>> and s-type expressions. Additionally, the only reason why this principle has been introduced is in order to preserve the overall simplicity derived from adopting type <*e*, <*s*, *t*>> for predicates – which is, after all, a far less common type in intensional settings.

[85] Of course, the functioning of this existential quantifier is a bit different, because it does not combine with an open formula, but rather with an open predicate. There is in principle no obstacle for thinking of the meaning of the existential quantifier as a function whose domain does not only include formulae but also predicates of this kind, but, even if this shall be a problem, recall that it is still possible to treat past tense as referential.

can combine with "that" in order to obtain a referent, one that, in virtue of the definition of the δ function, will need to satisfy, for some instant of time t occurring before $g(t_4)$, being a cleric in $<g(w_2), t>$ and crowning $g(5)$ in $<g(w_2), t>$. But, importantly, this demonstrative will eventually be quantified into: the variable 5 will be bound by a higher lambda, and, more relevantly, the time and world variables w_2 and t_3 contained in this demonstrative will end up bound by the lambda fronting the whole sentence. The latter kind of binding will render the demonstrative circumstance-dependent rather than context-dependent.

I am not claiming that this is entirely accurate nor that it does not require further justification (see e.g. footnote 84). Recall, however, that this departure from a standard theory of tense is something that I adopted for simplicity's sake, and that many of the solutions listed above could be adjusted in order to achieve similar results. Here is, however, some initial plausibility to this idea: this does not just solve our problem with (77), it also accounts for the two readings of (168). Consider the two possible LF's that the current system predicts this sentence can have:

(168d) $\lambda<w_0, t_1>. <w_0, t_1>$ [A fellow student who$_2$ [$\exists t_3$: $t_3 < t_1$] ($<w_0, t_3> r_2$ wears glasses)] $\lambda 4$. Julia is married to r_4

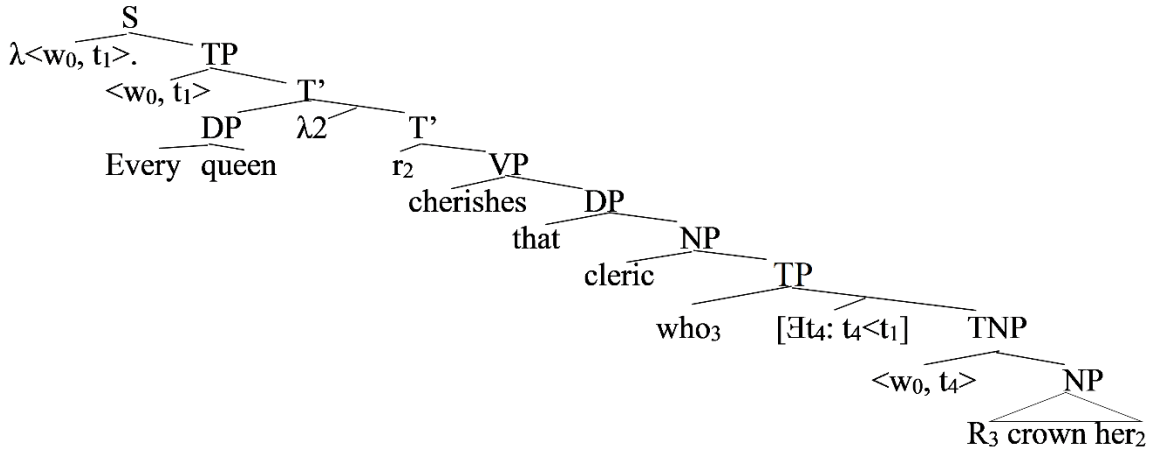
(168e) $\lambda<w_0, t_1>. <w_0, t_1>$ [A fellow student who$_2$ [$\exists t_3$: $t_3 < t_1$] ($<w_0, t_3> R_2$ wears glasses)] $\lambda 4$. Julia is married to r_4

The only difference between these two is the type of the movement trace. In (168d), the property "fellow student" combines with "who wears glasses" by INDIVIDUAL IDENTIFICATION and it is passed up and saturated with the tense of the main clause, just like "married". Thus, (168d) is true just in a circumstance *i* just in case Mary is married to an *x* such that *x* is a fellow student of hers in *i* and *x* used to wear glasses in w_i and a time before t_i. But (168b), on the other hand, follows the pattern of (170): "wears glasses" and the variable "R_2" are both of the same type, and thus they can combine by PREDICATE MODIFICATION to obtain the predicate $\lambda x.\ \lambda i.\ g(R_2)(x)(i) = 1$ & *x wears glasses in i*, for some assignment g. In virtue of CIRCUMSTANCE SPECIFICATION, this complex predicate can be saturated by the tense and mood just above it, thus resulting in $\lambda x.\ \lambda i.\ g(R_2)(x)(<g(w_0), g(t_3)>) = 1$ & *x wears glasses in* $<g(w_0), g(t_3)>$, which is in turn modified

by the existential quantifier over times. The resulting tensed predicate is taken as argument by "who", yielding a function from predicates to predicates. Combining the latter with "fellow classmates" yields the intended result: *λx. λi. there is a time t occurring before g(t_3) such that x is a fellow classmate (of Julia) in <g(w_0), t> & x wears glasses in <g(w_0), t>*, i.e., their being classmates must be simultaneous with the wearing of the glasses. Applying the usual semantic operations, and binding the variables within this predicate, we obtain the required result: (168e) is true in a circumstance *i* just in case there is an *x* such that that, for some time occurring before t_i, *x* wears glasses in <w_i, t>, *x* is a fellow classmate of Julia in <w_i, t>, and Julia is married to *x* in *i*. This provides a bit of independent justification for CIRCUMSTANCE SPECIFICATION.

Let us see how it deals with the variant of the problem of intensional mismatch that (77l)-(77m) above were subject to. Here is the new tree and its truth-conditions (the letter "S" indicates an intension):

(77n)



(77o) λc. λi. ∀x (x is a queen in i → x cherishes $\underline{\delta_c(\lambda y.\ \lambda j.$ there is a time t such that t occurs before t_j and y is a cleric in <w_j, t> and y crowns x in <w_j, t>)} in i)

This is the result we intended to achieve: (77o) is true at any circumstance i such that every queen in i cherishes an individual that, for some time *t* occurring before t_i, that individual is a cleric in <w_i, t> and crowned her in <w_i, t>. Of course, in the function *λy. λj. there is a time t such that t occurs before t_i, y is a cleric in <w_i, t> and y crowns x in <w_i, t>*, the circumstance argument *j* is entirely idle: the function assigns truth, simply, to any

individual *y* that satisfies the relevant properties in the circumstance *i*. The value of this function does not vary across circumstances, only across individuals. This means that the δ function, when fed with *λy. λj. there is a time t such that t occurs before* t_i*, y is a cleric in* $<w_i, t>$ *and y crowns x in* $<w_i, t>$, will select an individual having the relevant properties in *i*, regardless of her deeds in the circumstance of the context. Of course, *i* is eventually bound, thus rendering the whole demonstrative circumstance-dependent.

The problem of intensional mismatch is thus solved: even if we reject the extensional solution and decide to preserve intensions, it is possible for the c-theorist to predict the right truth-conditions for (77) and for any other complex demonstrative containing a verb. All she needs is to find a way to saturate the time and world slots of the noun attached to the demonstrative with the time and world contributed by verbal morphology. This is an adjustment we needed for independent reasons anyway, and it does not matter whether it is achieved by means of the account just sketched or in some other way. Let's dub this the "*circumstance binding solution*". This is my intensionalized alternative to the extensional solution I presented above. As we shall see later, the machinery employed in this solution, including principles like CIRCUMSTANCE SPECIFICATION, can also be useful for the extensional solution.

Before applying these two solutions to the counterevidence from section 2.2.1.2, I would like to discuss an important feature of the circumstance-binding approach. As I have already mentioned, this way of understanding complex demonstratives yields an interesting prediction: whenever the demonstrative contains a verb, its extension will depend on the circumstance, instead of the context. This may seem *prima facie* strange, but it fits nicely with a pattern noted by Wolter (2006) and further expanded on by Nowak (2019a). These authors point out an important contrast between complex demonstratives containing relative clauses and those containing simply a non-verbal predicate. We have already mentioned an example of this contrast:

(130a) *That author of *Waverley* also wrote *Ivanhoe*

(130b) ^{OK}The author of *Waverley* also wrote *Ivanhoe*

(130c) ^{OK}That author who wrote *Waverley* also wrote *Ivanhoe*

Unless some background is provided,[86] (130a) is infelicitous, as stated above; by contrast, (130c), which also contains a complex demonstrative, is perfectly fine whenever uttered, just like (130b), which contains a definite description. In general, complex demonstratives containing a relative clause, like the one in (130c), can be employed *non-deictically* (i.e., with no intention to refer to anyone in particular), much like if they were definite descriptions, whereas the simpler ones containing just a noun phrase, like the one in (130a), are much more likely to be used referentially, and they are often infelicitous in case there is only one object satisfying the descriptive meaning of the demonstrative (e.g., "author of *Waverley*"). Thus, the former category covers most of the counterevidence from section 2.2.1.2, including (78), (80), (82), (84), (85), (88a-b) and (89), whereas the latter includes the most favorable cases for the directly referential view, namely those discussed in section 2.1.2 when presenting the main tenets of c-theories.

The circumstance binding solution predicts a contrast between these two categories of complex demonstratives: namely, those containing a relative clause come out as circumstance-dependent, whereas the simpler ones are context-dependent. Thus, it fits the pattern fairly well, for it predicts that complex demonstratives containing a relative clause, like the one in (130c), have roughly the truth-conditions of a definite description. Here is the LF and truth-conditions predicted for this sentence:

(130d) $\lambda<w_0, t_1>$. [$\exists t_2$: $t_2 < t_1$] ($<w_0, t_2>$ [That author who$_3$ [$\exists t_4$: $t_4 < t_1$] ($<w_0, t_4>$ R_3 writes *Waverley*)] also writes *Ivanhoe*)

(130e) $\lambda c.\ \lambda i.$ There is a time t occurring after t_i such that $\underline{\delta_c(\lambda y.\ \lambda j.$ there is a time t' such that t' occurs before t_i and y is an author in $<w_i, t'>$ and y writes Waverley in $<w_i, t'>)}$ writes *Ivanhoe* in $<w_i, t>$)

I.e., (130d) is as circumstance-dependent as a definite description: it will be true in a random circumstance *i* iff a certain individual who authored *Waverley* in *i* also authored *Ivanhoe* in *i*. Thus, a *prima facie* positive feature of my account is that it predicts that (130c)

[86] Sentence (130a) may be made felicitous under some assumptions. If we supposed, for example, that *Waverley* had been co-authored, (130a) would sound much better. Nowak (2019a) himself provides an example of a felicitous utterance of a sentence much like (130a):

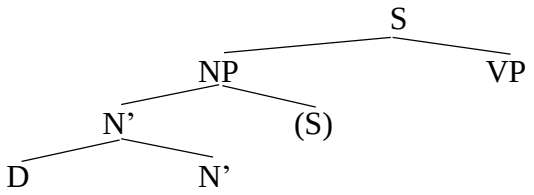
(n) That author of *Principia Mathematica* looks friendly, but I wouldn't try to get an autograph from that one

Thus, the appropriateness of this kind of constructions seems to be highly context-dependent.

patterns together with the perfectly acceptable (130b) instead of the infelicitous (130a). Definite descriptions are circumstance-dependent, and they can be employed non-deictically. In fact, all that needs to be done in order to fix the infelicity of (130a) is to substitute "that" for "the", as in (130b), in order to make it circumstance-dependent. Interestingly, (130c), which is also circumstance-dependent, is perfectly felicitous too.

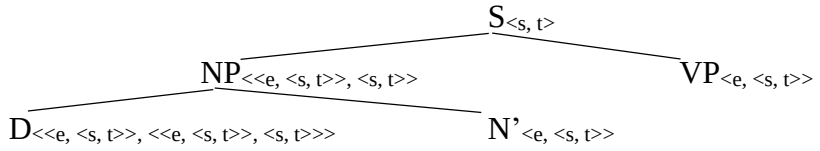
I do not intend to provide a full explanation of what generates this contrast; for the purposes of this dissertation, I am happy simply with acknowledging that my account conforms to the appropriate pattern. Let me, however, briefly discuss one attempt to explain the contrast. Nowak's (2019a) account appeals to the classical NP-S syntactic configuration in which NP's are generated by combining a determiner with two arguments (Bach & Cooper 1978), instead of the standard configuration in which it combines with just one (Partee 1975). On the former configuration, noun phrases have the following syntactic structure:

(171)



For example, "the man I saw yesterday is bald" is obtained by combining "the" with "man" into the N´ "the man", which in turn combines with the relative clause "I saw yesterday" in order to generate an NP. This, in turn, combines with the VP "is bald" in order to arrive at a full sentence. Partee (1975) famously suggested that the following configuration was semantically more appropriate:

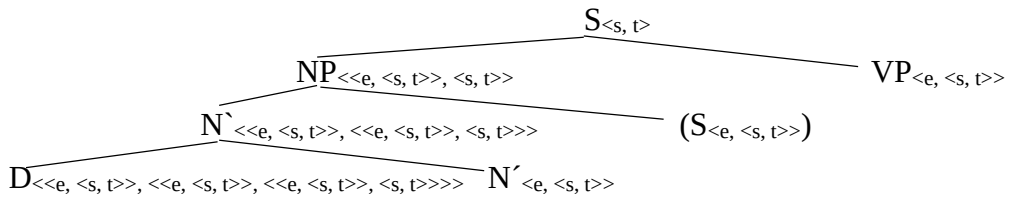
(172)



Here, the N´ can, of course, be in turn composed of another N´ and a relative clause. The problem with (171), according to Partee, is that it makes it impossible to arrive at the

correct denotation of the noun phrase. If "the" combines first with "man", the resulting N' denotes the unique man in the domain of discourse. But this is wrong: we want to talk about the unique man that I saw yesterday, regardless of how many other men the domain may contain (see Chomsky 1975 for discussion). Emmon Bach and Robin Cooper suggested that (171) could still be retained, simply, if we raise the type of the determiner, thus:

(171a)



On this classical, non-standard analysis, determiners combine first with a noun phrase and then with a relative clause, if there is one. Bach and Cooper cite evidence from Hittite to argue that this configuration is preferable, and Nowak appropriates a version of this analysis for his account. On his view, the determiner "that" triggers a syntactic configuration like the one in (171), i.e., it combines with two arguments: an N' and a relative clause. Semantically, however, the resulting combination is a singular term pretty much like a Strawsonian definite description: "that" is of type <<e, <s, t>>, <<e, <s, t>>, <s, e>>>. This means that it combines with the two arguments and returns an object satisfying both predicates in a certain circumstance. Nowak's main innovation comes from the presuppositions he associates with "that": it triggers a non-uniqueness presupposition for the N' and a uniqueness presupposition for the combination of both arguments. Thus, any NP of the form "that F which Gs" will select an object under the presupposition that it is not the only one in the extension of F but it is the only one to satisfy both F and G. If there is no second argument (i.e., no relative clause), then the demonstrative combines with a contextually determined property – say, the property of *being identical to Walter Scott*. These presuppositions are, according to Nowak, what explains the above-mentioned contrast: the "that"-term (130c) selects an object *a* under the presuppositions that *a* is not the unique author in the world and that *a* is the only author who wrote *Waverley*, whereas the complex demonstrative in (130a), on the contrary, picks out an object under the presupposition that there is more than one author of *Waverley* – hence its infelicity.

This is a very elegant way to account for the data, although some counterexamples could be raised against the non-uniqueness presupposition triggered by the first argument. For example, a sentence like (173) can be uttered felicitously, and even truly, in some sort of post-apocalyptic situation, but Nowak's semantics predicts that it can never be used felicitously and truly, for it presupposes that there is more than one dog:

(173) That dog is the last mammal on Earth

Other, more direct counterexamples to the non-uniqueness presupposition include the complex demonstratives in the following examples:

(174) On every team there is one player who is not as strong as the rest. *That weakest member* is the one to play hardest against (Maclaran 1982)

(175) *This first Christmas Night* (title of a book by Laura Godwin & William Low, 2016, MacMillan)

In addition, it is worth mentioning that, in languages such as German, Spanish or French, demonstratives of the form as "this first F" or "that last P", which contradict the non-uniqueness presupposition triggered by the noun phrase, sound much more felicitous than their English counterparts, and they are more likely to be found. English is no exception, however, for, although saying "this first F" or "that last F" is not as usual as it is in other languages, complex demonstratives of this form are often perfectly felicitous:

(176) This last response on the part of the coordination account brings up an important point (fragment of a paper by King 2020: 66)

All of this could be fixed by qualifying the non-uniqueness presupposition some way or another (Nowak himself discusses similar cases in 2019a, sections 6.1 and 6.2). However, the uniqueness presupposition triggered by the combination of the noun phrase and the relative clause can also be problematic, for it is easily cancellable:

(177) That man who is following us seems unaware that there is yet another man following us

(178) That woman wearing a coat thinks that that other woman wearing a coat is my wife

If the appropriateness of (177) requires a unique man to be following the participants in the conversation, then it should be self-contradictory, yet it seems perfectly fine. Similarly, (178) shows that it is possible to employ the same complex demonstrative for picking out different objects even if it contains a relative clause – it is admittedly a bit wordy, but nevertheless perfectly grammatical. None of these counterexamples constitute knock-down arguments against Nowak's elegant system, but they certainly suggest that the explanation may lie elsewhere.

The hypothesis I am inclined to defend is that the infelicity of (130a) can be accounted for on Gricean principles; namely, my conjecture is that the non-uniqueness it communicates is implicated, and not presupposed. The availability of (130b), which does presuppose (or assert) that the author of *Waverley* is unique, has a role to play in the explanation: if a speaker chooses to utter (130a) instead of the more informative (130b), she may be taken to imply that the uniqueness presupposition triggered by the definite description does not hold. Other possible factors explaining the infelicity of (130a) taken in isolation may include the lack of a referent which can be easily retrieved from the context, whereas this should not be problematic for its non-context-dependent counterparts (130b) and (130c). This is still very sketchy as an explanation, but a full account of the above contrast lies beyond the scope of this dissertation. For the moment, it suffices to acknowledge that my account conforms to the appropriate pattern, i.e., that it predicts that (130c) is more similar to (130b) than to (130a).

Let us now move on and see the predictions that both the extensional and the circumstance-binding solutions make about all the other counterexamples to c-theories. NS-readings, for instance, are straightforwardly accommodated insofar as they are just a variant of QI-uses. The extensional solution, for example, predicts that (80) should receive the LF and truth-conditions in (80a) and (80b), whereas the circumstance-binding solution predicts that these should be (80c) and (80d), respectively. As mentioned above, "will" is treated as an existential quantifier over times in these examples:

(80a) $[\exists t_2\colon t_2 > t_1^{pres}]$ $(<w_0^{ind}, t_2>$ [Each division] $\lambda 3$. that professor who$_4$ $[\exists t_8\colon t_8 < t_7^{pres}]$ $(<w_6^{ind}, t_8>$ r_4 brings in the biggest grant in r_3) is honored)

(80b) $\lambda c.\ [\exists t: t > t_c]\ (\forall x\ (x \text{ is a division in } \langle w_c, t\rangle \rightarrow \underline{\delta_c(\lambda y.\ \lambda j.\ y \text{ is a professor in } j \text{ and there is a time } t' \text{ such that } t' \text{ occurs before } t_c \text{ and } y \text{ brings in the biggest grant in } x \text{ in } \langle w_c, t'\rangle)}$ is honored in $\langle w_c, t\rangle$)

(80c) $\lambda\langle w_0, t_1\rangle.\ [\exists t_2: t_2 > t_1]\ (\langle w_0, t_2\rangle$ [Each division] $\lambda 3.$ that professor who$_4$ $[\exists t_5: t_5 < t_1]\ (\langle w_0, t_5\rangle\ R_4$ bring in the biggest grant in r_3) is honored)

(80d) $\lambda c.\ \lambda i.\ [\exists t: t > t_i]\ \forall x\ (x \text{ is a division in } \langle w_i, t\rangle \rightarrow \underline{\delta_c(\lambda y.\ \lambda j.\ \text{there is a time } t' \text{ such that } t' \text{ occurs before } t_j \text{ and } y \text{ is a professor in } \langle w_i, t'\rangle \text{ and } y \text{ brings in the biggest grant in } x \text{ in } \langle w_i, t'\rangle)}$ is honored in $\langle w_i, t\rangle$)

Let me briefly explain each of these. The presuppositional material in (80a) ensures that, for any context *c* in which the sentence is interpretable, $g_c(t_1) = g_c(t_7) = t_c$, and $g_c(w_0) = g_c(w_6) = w_c$. At the same time, the definition of the δ function ensures that "professor" will be assessed in the circumstance of the context, i.e., $i_c = \langle w_c, t_c\rangle$. This suffices for ensuring that all the predicates in the sentence will be coordinated: all of them will be assessed either at i_c or in a circumstance suitably related to i_c. In particular, the bringing in of the biggest grant is required to take place in a time t' occurring before t_c, and the honoring has to take place after t_c. This is intuitively right. As a result, (80a) is true in any context in which, for each division *x*, a certain individual is honored in a time occurring after t_c, namely an individual that is required to have brought in the biggest grant in *x* in a time occurring before t_c. Of course, the demonstrative contains a bound variable, which accounts for its non-directly referential nature: the external binder is quantifying into the character of the complex demonstrative.

(80c), on the other hand, is not too different. All the time and world variables contributed by present and indicative are co-indexed, and they are bound by the upper lambda. This ensures that they all will be assessed in the same circumstance, namely the circumstance of evaluation; in fact, the circumstance privileged by the context is irrelevant. The use of the variable for predicates R_4 and the combination by CIRCUMSTANCE SPECIFICATION ensures that this sentence won't be subject to the version of intensional mismatch that (77l) was subject to: "professor" will end up interpreted according to the circumstance in which we are assessing the whole sentence. In general terms, any QI-

sentence in which the complex demonstrative contains a verb can avoid the problem of intensional mismatch.[87]

[87] Here is a possible complication that can be raised agains the circumstance-binding solution: there might be QI-sentences in which the complex demonstrative does not contain any verbal morphology. This is, for example, the case of sentence like (o) and the already-mentioned (81):

(o) Every professor cherishes that first publication of hers (King 2001)

(81) That senator with the most seniority on each committee is to be consulted

Without further adjustments, my circumstance-binding solution is unable to handle the problem of intensional mismatch for these two sentences, for it predicts that the descriptive material "first publication of hers" and "senator with the most seniority" will have to be assessed in the circumstance of the context, whereas "professor", "cherish", "committee" and "consulted" will still be circumstance-dependent. These sentences are not problematic just for my account; Nowak (2019a), for example, acknowledges that these examples may be problematic for his too, for the complex demonstratives here are used non-deictically in spite of the fact that they contain no relative clause.

I do not think, however, that these examples constitute a knockdown argument against my circumstance-binding solution. In the first place, an important thing to have in mind is that, unlike the other sentences we've been discussing, neither (81) nor (o) enjoy crosslinguistic support. As Corazza (2003) pointed out, the literal translation of (o) into French or Italian is not entirely ungrammatical, but a bound reading is impossible (i.e., it can only be employed for referring to a particular object; see the discussion in Corazza (2003: 272-273)):

(p) #[Chaque professeur]$_1$ estime sa$_1$ première publication

(q) #[Ogni professore]$_1$ valorizza quella sua$_1$ prima pubblicazione

Other Romance languages follow the same pattern. The literal translations of (o) into Catalan and Spanish also result in ungrammaticality:

(r) #[Tot professor]$_1$ s'estima aquella primera publicació seua$_1$

(s) #[Todo profesor]$_1$ aprecia aquella primera publicación suya$_1$

These data are still preliminary, but they point towards the idea that examples like (81) and (o) do seem to be an indiosyncrasy of English. In fact, let me examine the literature in order to gain support for this idea. When Nowak (2014) gathers crosslinguistic evidence for the idea that QI is not exclusive to English, all his examples involve complex demonstratives containing a tensed verb. On the other hand, the discussions on analogous examples in Higgingbottam (1988), Neale (1993: 107), Lepore & Ludwig (2000) and Georgi (2012: 383, footnote 18) suggest that even some English speakers judge examples like (81) and (o) to be ungrammatical, or at least highly unnatural. Interestingly, each of the examples that these authors regard as odd in the above papers are QI-uses in which the complex demonstrative contains no relative clause.

These facts suggest that QI-uses with no relative clause are sort of unnatural and, in fact, indiosyncratic to English. Consequently, I believe that these counterexamples do not constitute knockdown evidence against the circumstance-binding solution, for, contrary to the rest of counterexamples, they can be safely put aside or disregarded as exceptions. For example, the pragmatic arguments presented in Braun (2008a), who maintains an "error theory" with respect to the truth-conditions of complex demonstratives, are much more likely to hold for QI-uses with no relative clause. Indeed, the fact that these uses are not crosslinguistically supported renders support to Salmon's idea that complex demonstratives may sometimes work as "stylistically altered definite descriptions" (Salmon 2002, 2006a, 2006b) (see the discussion in 2.3).

But, even if further research should disconfirm the idea that felicitous uses of these examples are indiosyncratic, the c-theorist willing to preserve intensions still has many other options at hand. One could, for example, borrow the idea that "that", *qua* determiner, can yield hidden variables for implicitly restricting the domain of objects that can serve as the value of the demonstrative (cf. von Fintel 1994). I.e., it is possible to make (o) mean (t) in a context:

(t) $\lambda<w_1, t_2>$. Every professor cherishes in $<w_1, t_2>$ [that first publication of hers *in* $<w_1, t_2>$],

where the material in italics is added by means of a context-dependent hidden variable (for some criticism towards similar ideas, see Cappelen & Lepore 2002, 2005). Another, more plausible idea is to try to achieve the required reading by means of scoping. Namely, we could try to move the predicate outside the demonstrative and leave a trace there:

(u) $\lambda<w_1, t_2>$. $<w_1, t_2>$ [Every professor] $\lambda 3$. [being a first publication of hers$_3$] λR_4. r_3 cherishes [that R_4]

The adoption of a system employing explicit object-language quantification over worlds and times also shows that many of the sentences apparently involving no binding may turn out to be cases of QI, too. Consider, e.g., sentence (89), repeated below:

> (89) If Gore had won the election, he would definitely have embraced that elector who cast the deciding vote

This sentence is a subjunctive conditional, just like (158) above. As stated in section 3.3.1.2, these sentences are usually dealt with by means of the Lewis-Stalnaker semantics for counterfactuals, but it is clear that our current system cannot treat "□→" as an intensional operator: it should be a quantifier on its own. Let me therefore find a suitable translation for it.

My translation of "□→" into a system with explicit time and world variables follows, essentially, the one proposed by Rabern (2012b). For simplicity's sake, let me momentarily disregard time variables and focus just on quantification over worlds. Additionally, let me focus on the circumstance-binding solution rather than the extensional one, for the latter involves some minor complications that I discuss below. The functioning of the operator "□→" can be adapted to our system by letting each sentence of the form "*if it were the case that p, then q*" be given an LF like "$\lambda w.\ [\forall w_1:\ w_1 \in C^w(p)]\ (w_1\ q)$", where "$C^w(p)$" is, as above, the set of worlds closest to *w* in which *p* holds (assume that this set is represented in the same manner no matter whether we are in the object-language or the metalanguage). Thus, the LF of (89) can be rendered as (89a):

> (89a) $\lambda w.\ [\forall w_1:\ w_1 \in C^w(\text{Gore wins the election})]\ (w_1$ Gore embraces that elector $\text{who}_2.\ w_1\ R_2$ cast the deciding vote)

Of course, the complex demonstrative contains a world variable, w_1, that is bound by an external operator, meaning that its character is being operated on. This means that, in this

---

The latter option ensures that the predicate "being a first publication of hers" will receive the right interpretation, for it will be filled with the circumstance of the matrix clause, i.e., $<g(w_1,)\ g(t_2)>$. Thus, the complex demonstrative will end up taking as argument a property that is not sensitive to circumstances, and will therefore pick out a referent that need not have any particular property in the circumstance of the context. Of course, the upper lambda will bind the circumstance, thus rendering the demonstrative circumstance-dependent and, more relevantly, will make the predicates "professor" and "cherish" be intensionally coordinated. Similar options are explored, although for different reasons, in Heim & von Fintel (2011: 93-98).

case too, the non-deictic nature of this demonstrative is due to QI. The truth-conditions of this sentence are a bit messy, but they yield the right result:

> (89b) λc. λw. [∀w': w' is among the worlds closest to w such that Gore wins the election in w'] (Gore embraces $\underline{\delta_c(\lambda y.\ \lambda w''.\ y \text{ is an elector in } w' \text{ and } y \text{ casts the deciding vote in } w')}$ in w')

This is true in a context *c* and world *w* iff, for each of the worlds *w'* such that *w'* is among the closest to *w* and Gore wins the election in *w'*, it is also the case that Gore embraces in *w'* a certain individual, namely one satisfying *λy. λw''. y is an elector in w' and y casts the deciding vote in w'*. Of course, the world argument *w''* in this function is idle, just as the circumstance argument in (77o); this means that it is insensitive to the circumstance of the context: the δ function only takes into account facts occurring in *w'*. But, on the other hand, the latter variable is bound by an external operator, and this accounts for the idea that the complex demonstrative will take different values in each of the worlds in the set C^w (Gore wins the election). This sentence is presented by Nowak (2014) as a case of modal anchoring without anaphora, but this diagnosis is not entirely accurate if we adopt a system like the one advocated here: insofar as binding is a type of anaphora, the complex demonstrative in this sentence does contain anaphoric dependence – although not of the kind Nowak had in mind in his discussion.

The extensional solution, on the other hand, raises some difficulties. If we attempt translating (89) in the most conservative manner, i.e., without resorting to CIRCUMSTANCE SPECIFICATION nor any non-orthodox treatment of the relative pronoun, we arrive at the following LF and truth-conditions:

> (89c) $[\forall w_1: w_1 \in C^{w_{ind}}$ (Gore wins the election)] (w_1 Gore embraces that elector who_2 w_1 r_2 cast the deciding vote)
>
> (89d) λc. [∀w': w' is among the worlds closest to w_c such that Gore wins the election in w'] (Gore embraces $\underline{\delta_c(\lambda y.\ \lambda w''.\ y \text{ is an elector in } w'' \text{ and } y \text{ casts the deciding vote in } w')}$ in w')

The problem here is that the world argument *w''* in the function *λy. λw''. y is an elector in w'' and y casts the deciding vote in w')* is not idle. This means that the δ function will

select an individual satisfying the property of casting the deciding vote in *w'* and being an elector in the world of the context – the problem of intensional mismatch strikes back. There are two possible responses to this problem. One of them is, simply, to adopt the idea that "who" can bind property variables and to incorporate CIRCUMSTANCE SPECIFICATION into our inventory of rules. Then we can provide the following LF and truth-conditions:

(89e) $[\forall w_1: w_1 \in C^{w_{ind}}$ (Gore wins the election)] (w_1 Gore embraces that elector who_2 w_1 R_2 cast the deciding vote)

(89f) λc. [∀w': w' is among the worlds closest to w_c such that Gore wins the election in w'] (Gore embraces $\underline{\delta_c(\lambda y.\ \lambda w''.\ y \text{ is an elector in w' and y casts the deciding vote in w')}}$ in w')

This is right, but the drawback is that our system is not as conservative as we would like it to be. There is nevertheless still a second possible answer, one that could be formulated in metaphysical terms and that would allow us to preserve (89c-d). Recall that (89d) assigns truth to any context *c* such that, for each of the worlds *w*' such that *w*' is among the closest to w_c and Gore wins the election in *w*', it is also the case that Gore embraces in *w*' an individual *y* satisfying *being an elector in* w_c and *casting the deciding vote in w'*. It could be argued (and this is not an uncontroversial premise) that, if *y* is an elector in w_c, she will also be so in all the worlds $w' \in C^{w_c}$ (Gore wins the election). That is, any world in which Gore wins the election but the electors are different individuals (say, because the population of the United States has increased or decreased, because a law changing the minimum legal age for voting has been passed, etc.) could be argued to be further away from the actual world than one in which he wins but the set of electors is the same. Under this controversial premise, (89d) is just equivalent to (89f). I am not entirely sure about this response, and I am afraid that the debate itself is hard to settle in these terms, for the notion of similarity it relies on is far from well-established.

At any rate, this discussion points toward an important conclusion: most non-deictic uses of complex demonstratives can be explained away as instances of monstrous quantification into the character of the term. King's QI-uses are a paradigmatic example of this phenomenon, but this very analysis can be applied to many other cases. Adopting explicit

world and time variables yields the result that many instances of modal anchoring turn out to be special cases of QI; (89) is one such case. In this sentence, the variable contributed by the verb's morphology is bound by an operator that is external to the complex demonstrative, and this is what explains that its value may vary from world to world, just like the value of the demonstrative in (77) varies across individuals. The intervention of monsters always generates non-deictic readings of indexicals, and complex demonstratives are not an exception. It is now the time to momentarily interrupt the discussion and examine the philosophical significance of the notion of *monster* and its relationship with other concepts like *direct reference* or *compositionality*.

3.3.2 Excursus: Singular terms, rigid designation and direct reference

The discussion in the last section attempted to show that the most important set of counterexamples presented by King, QI-uses, can be easily handled by c-theories as long as some independently motivated changes are implemented into the theory. These include the rejection of condition (27i) on the basis of facts about analyticity and psychological plausibility, and the adoption of a system with full object-language quantification over times and worlds, grounded on issues pertaining to the expressive power of natural language. The current framework, however, faces an important objection: it makes extensive use of Kaplanian monsters. Thus, it achieves the right predictions, but only at the price or not upholding the prohibition to operate on character. And, although the "no monsters thesis" is often seen as an empirical claim, it seems clear that Kaplan intended it as a normative one, i.e., as a desideratum that any semantic theory should meet. In his own words, "I am not saying that we could not construct a language with such operators, just that English is not one. And such operators *could not be added to it*" (Kaplan 1977: 510; original emphasis).

If Kaplan's point is not just that English does not contain monsters but rather that monsters should be avoided, as the last sentence from the former paragraph suggests, then it is clear that our current framework does not abide by this principle. One might now wonder what is the motivation for banning this kind of operators, and whether our system can legitimately lift the prohibition.

3.3.2.1 Monsters, compositionality and what is said

Kaplan's prohibition of monster operators is sometimes seen as necessary for maintaining that indexicals are directly referential. The assumption that contexts cannot be shifted, paired with the idea that the sole contribution of an indexical given a context is an object, lay the ground for this model: once their value has been fixed, all we need to take into account is the individual they select. This explains all the facts about opacity and singularity, trademarks of direct reference. But, if monsters exist, then there is a kind of operators that indexicals are not opaque to. More accurately, there are some environments in which we cannot rest content just with the object selected by the indexical: we must take its character into account. This is in conflict with the way Kaplan characterizes direct reference in his "Principle 2":

> "When what was said in using a pure indexical in a context *c* is to be evaluated with respect to an arbitrary circumstance, the relevant object is always the referent of the indexical with respect to the context *c*." (Kaplan 1977: 500)

Allowing monsters conflicts with this principle, for it would entail that the object selected by an indexical in a circumstance may sometimes turn out to be irrelevant for assessing the value of the whole sentence. Although it is not clear whether this is actually in conflict with the notion of *direct reference* (see the next section and the debate between Salmon (2006b, 2008) and King (2008b)), it is worth discussing the notions at stake.

At first sight, a prohibition of context-shifting operators does not seem to have much of a point. Whether natural language happens to have such devices looks like an empirical claim – a claim challenged, for example, by the work of Schlenker (2003) and Anand and Nevins (2004). The motivation behind Kaplan's prohibition bears more philosophical import: as we shall see, it is what allows him to maintain *compositionality* at the level of assertoric content. It is, informally speaking, what allows indexicals to always make the same contribution (their content instead of their character) to *what is said* by larger expressions containing them. Let us see why.

The first thing to be done is to clarify the notion of compositionality and its role within semantics. Informally, compositionality is most often understood as the idea that the meaning of a complex expression should be determined by the meaning of its component parts. This is supposed to explain many important features of natural language, such as productivity,

systematicity and learnability, and to account for phenomena such as synonymy, analyticity and intersubjective communication.[88] It is therefore a central notion in semantic theorizing; in fact, it is often seen as a methodological assumption (Lewis 1970, Yalcin 2014). From a formal point of view, compositionality can be understood as the idea that the meaning of a complex expression is a function of the meaning of its subexpressions. There is also an alternative formulation, first due to Frege (1892), that says that substitution of substrings with the same meaning should have no effect on the meaning of the whole. The first to explicitly state both versions of the principle was Rudolf Carnap (1947), and in this dissertation I will be working with the standard formulations by Peter Pagin and Dag Westerståhl (2010a: 254). Let me state them formally.

Compositionality is a property of a semantics with respect to a syntax; it is usual to think of the latter as an algebra <E, A, Σ> consisting of the set E of expressions of the language, a set A of primitive symbols (lexical items) and a set Σ of syntactic operations such that E is generated from A through Σ. A semantics μ, in turn, is a function that maps every meaningful expression in E to its semantic value. Once we have this, we can formulate both versions of compositionality as follows:

> Functional version of compositionality (FC): a semantics μ is compositional iff for every syntactic rule $\alpha \in \Sigma$ there is a function f_α such that $\mu(\alpha(u_1 \dots u_n)) = f_\alpha(\mu(u_1) \dots \mu(u_n))$.
>
> Substitutional version of compositionality (SC): a semantics μ is compositional iff for any two meaningful terms $\alpha(u_1 \dots u_n) \in E$ and $\alpha(t_1 \dots t_n) \in E$, if $\mu(u_1) = \mu(t_1) \dots \mu(u_n) = \mu(t_n)$, then $\mu(\alpha(u_1 \dots u_n)) = \mu(\alpha(t_1 \dots t_n))$.

FC presupposes the idea that subterms of meaningful terms are meaningful – what Pagin and Westerståhl (2010a) call the *domain principle* (DP). Under DP, both versions are equivalent, and, since this principle holds in any standard semantic system,[89] let me use them interchangeably.

Many semanticists distinguish more than one level of meaning, in which case it is possible that compositionality holds at certain levels but not at others. In the terminology just

[88] See Pagin & Westerståhl (2010b) for an overview of how these and other issues have been used as evidence that compositionality is a feature of natural language.
[89] See Gimeno-Simó (manuscript) for discussion.

stated, whether compositionality holds depends on which level of meaning the variable μ stands for. For example, it could happen that Frege's system were compositional at the level of sense but not reference; in fact, most semantic systems are not compositional when μ is understood as the *extension* of the expressions.[90] In a system like Kaplan's, in which expressions are endowed with character, content and extension, the question whether compositionality holds can be asked regarding all three kinds of meaning. More concretely, the level of compositionality we are primarily concerned with is *content-compositionality*. As we shall see now, this appears to be the main motivation behind Kaplan's ban on monsters.

Content, unlike character, is not a property of bare expressions, but of expressions in a context, so *prima facie* the idea of compositionality may seem difficult to implement in this case. But, from a technical point of view, there is no difficulty whatsoever. Westerståhl (2012) has shown that the notion of compositionality generalizes to expressions in a context: all we have to do is to modify our definitions by adding the contextual item along with the syntactic string. Let $\mu_{cont}(e, c)$ be the content of expression *e* in context *c*. In that case,

> Functional version of content-compositionality (FCC): LD is content-compositional iff for every context c and every syntactic rule $\alpha \in \Sigma$ there is a function f_α such that $\mu_{cont}(\alpha(u_1 \ldots u_n), c) = f_\alpha(\mu_{cont}(u_1, c) \ldots \mu_{cont}(u_n, c))$.

[90] Frege's system is compositional at both levels of meaning. Consider his own example:

(u) Hammurabi believes that Hesperus is bright in the evening

(v) Hammurabi believes that Phosphorus is bright in the evening

The system is reference-compositional iff the reference of a complex expressions is a function of the reference of its subexpressions and their syntactic ordering, and it is sense-compositional iff the sense of complex expressions is a function of the sense of their subexpressions and their syntactic ordering. At first glance it might seem that reference-compositionality does not hold, for, in principle, "Hesperus" and "Phosphorus" have the same referent and yet the references of (u) and (v) differ (the former is true and the latter is false).

But there is no such failure: the principle of context ensures that "Hesperus" and "Phosphorus" do receive different referents in this linguistic context – namely, their referent in this environment is their customary sense. Therefore it is possible to define a function *f* such that a) *f* yields truth when it takes the referents of all the subexpressions in (u) and b) it yields falsity when it takes all the referents of the subexpressions of (v). This means that Frege's system is compositional at the level of reference, and not just at the level of sense.

Things might get complicated, however, once we acknowledge Frege's hierarchy of senses (cf. Carnap 1947, Dummett 1973). Thanks to Jordi Valor for pointing this out.

Substitutional version of content-compositionality (SCC): LD is content-compositional iff for any context c and any two meaningful terms $\alpha(u_1 \ldots u_n) \in E$ and $\alpha(t_1 \ldots t_n) \in E$, if $\mu_{cont}(u_1, c) = \mu_{cont}(t_1, c) \ldots \mu_{cont}(u_n, c) = \mu_{cont}(t_n, c)$, then $\mu_{cont}(\alpha(u_1 \ldots u_n), c) = \mu_{cont}(\alpha(t_1 \ldots t_n), c)$.

With these definitions, it is not hard to see why allowing monsters is in conflict with maintaining content-compositionality. In a nutshell: monsters shift the context in which an expression is being assessed, and context is a parameter that generates content. This means that the semantic rule associated with the addition of the monster must operate on a level of meaning previous to content – namely, character. This is why adding monsters to LD would doom content-compositionality: the meaning of a monster cannot be given by a function of content. Let me expand a bit on this.

This point can be seen more clearly by means of an example. Recall our discussion with sentence (21) above. If *c* is a context having Theresa May as its agent, (21a) and (21f) have the same content at *c*:

(21a) I am tired

(21f) Theresa May is tired

Allowing monsters entails that there are linguistic environments in which these two sentences embed differently. For example, (21b) and (21g), which result from embedding (21a) and (21f) under our artificial "in some contexts", mean different things:

(21b) In some contexts I am tired

(21g) In some contexts Theresa May is tired

As always, structured propositions might be of some help here. (21b) and (21g) express, respectively, (21d) and (21h):

(21d) <<the agent, being tired>, being true in some contexts>

(21h) <<Theresa May, being tired>, being true in some contexts>

These examples make it clear that the semantic rule associated with the addition of the monster cannot be a function of content. Let *k* be a context such that a_k = Theresa May, and let β be the syntactic rule such that, for any formula Φ, β(Φ) yields the sentence "In some

contexts Φ" as a result. It is very easy to check that SCC does not hold: μ_{cont} ((21a), k) = μ_{cont}((21f), k), but $\mu_{cont}(\beta((21a), k)) \neq \mu_{cont}(\beta((21f), k))$.[91] In other words, (21a) and (21f) mean the same thing, but they embed differently: Frege's substitution test fails. FCC yields the same result: given that (21a) and (21f) have the same content in *k*, the semantic rule f_β associated with the addition of "In some contexts" should yield the same result no matter whether it is applied to the former or the latter. But this contradicts the fact that $f_\beta((21a), k) \neq f_\beta((21f), k)$. In other words, the content of (21b) in *k* cannot be given as a function of the content of its immediate subcomponent (21a) in the same context.

This should come as no surprise, for, after all, what is characteristic of monsters is that they do not operate on content but on character. It is now possible to state more clearly the philosophical relevance of this sort of operators. There are many passages of Kaplan's work in which he identifies his technical notion of content with "what is said" and "the objects of assertion and thought". On his view, a person uttering "Yesterday was Monday" on two different days isn't asserting the same thing, whereas two utterances of "I am bald" and "Julius Caesar is bald" made by Caesar himself do assert (or say) the very same thing. Maintaining compositionality at the level of content amounts to maintaining it at the level of what is asserted. Monsters would prevent LD from being compositional at both levels of meaning, and this is relevant insofar as it entails that there are meaning operations that cannot be given as a function of *what is said*.

Brian Rabern (2013) has developed an argument that shows that LD does after all contain monsters, though of a special kind: they are not to be found at context-shifting but at variable binding. He goes on to show that variable binders, such as quantifiers and lambda abstractors, deserve the label "monsters". Consider an open formula like (179a):

(179a) P*x*

The content of (179a) must be determined according to an assignment function that determines which object is the extension of *x* in every circumstance. This means that, as we already mentioned in section 2.1.1, assignment functions are content-generating parameters

[91] Just to make it sure, the content of (21g) in *k* is the function λi. ∃c. [[tired (May)]]$^{c, i}$, whereas the content of (21b) in *k* is a different one: λi. ∃c. [[tired (I)]]$^{c, i}$. Of course, the content of both (21a) and (21f) in *k* is given by the same function: λi. Theresa May is tired in i.

as much as contexts are – this is the reason why I followed the later Kaplan and added them as another parameter of context. It should be clear that in a framework like the current one variable binders come out as context-shifters. Consider (179b) and its truth-conditions:

(179b) ∃x (Px)

$[\![\exists x\ (Px)]\!]^{c,\,i} = 1$ iff there is some $a \in E$ such that $[\![Px]\!]^{c(a/x),\,i} = 1$, where $c(a/x)$ is the context that is just like c except that $g_{c(a/x)}$ assigns a to "x"

I.e., in the current framework, and the one endorsed by Kaplan in *Afterthoughts*, quantifiers shift the context parameter, and therefore straightforwardly qualify as monsters. One might wonder why this problem cannot be solved simply by placing assignment functions as a separate parameter, but this will not do. As Rabern and Derek Ball (2019) point out, the question is not just a matter of whether a theory allows context-shifting operators: even if we stick to the formalism of *Demonstratives* and place assignments outside contexts, these are still arguments to character. Formally, shifting assignments is on a par with shifting contexts: both of them are arguments that character needs to take in order to return content. Thus, even if variable binders did not qualify as context-shifters, they would still deserve being called "monsters", for *they shift a content-generating parameter*. And this means that the addition of a variable binder still results in a failure of content-compositionality.

Let us momentarily place assignments outside contexts. In that case, the content of (179a) in a context c and an assignment g is a function that assigns truth to every circumstance in which the image of "x" under g has the property designated by "P": $\lambda i.\ [\![P]\!]^{c,\,g,\,i}(g(x)) = 1$. But, clearly, the content of (179b) in g cannot be given by a function of the content of (179a) in g. Compare (179a-b) with (179c-d):

(179c) Py

(179d) ∃x (Py)

Assume, for the argument's sake, that $g(x) = g(y)$. In this case, (179a) and (179c) have exactly the same content under g. But, clearly, the content of (179b) and (179d) in g differs: the latter is still about g(y), but the former, on the contrary, is not about g(x) nor about any individual in particular. If the semantic rule associated with the addition of the quantifier were a function of contents, then it should yield the same result no matter whether we apply

it to (179a) or to (179c), for these two have the same content under *g*. But it is clear that this is not the case; the reasoning is entirely analogous to the one we carried out with (21a-h).

Content does not depend only on context, it also depends on assignment functions. Since quantifiers shift the latter, their occurrence has the same effect as context-shifters: whatever the referent of *x* in (179a) may be, it does not appear within the assertoric content of (179b), within *what is said* by it. This is so because the quantifier does not operate on the content of the variable, but on its character. Kaplan did not reject context-shifters *per se*, but only on the basis that contexts are tuples of content-generating parameters; if assignments generate content and quantifiers are assignment-shifters, there is no reason not to think of them as monsters. The notion of context-shifters is, as such, relatively uninteresting for philosophical purposes; a far more interesting notion of monster is what Rabern and Ball call "*content monsters*": operators that shift a parameter on which what is said depends (Rabern & Ball 2019: 401). In practice, this amounts to shifting the contribution that an expression makes to assertoric content. Such kind of operators prevent expressions from being compositional at the level of what is said.

If we identify the objects of assertion – or of thought – with Kaplanesque content, and quantified sentences fail to be compositional at the level of content, then LD fails in identifying compositional value and assertoric content. Now, pronouns are standardly analogized to variables, which means that the contribution that "she" makes to what is said gets shifted in its bound reading:

(180a) She is happy

(180b) Every girl thinks that she is happy

In other words, the quantifier "every girl" is a monster.[92] The case is completely analogous to the one above: compare (180a-b) and (180c-d):

(180c) Angela Merkel is happy

(180d) Every girl thinks that Angela Merkel is happy

[92] Strictly speaking, the monster is not the quantifier itself, but the lambda abstractor that it yields to LF when it is raised.

Under a certain assignment, (180a) and (180c) have the same content: the set of circumstances in which Angela Merkel is happy. However, (180d) and the bound reading of (180b) do not say the same thing. This is so, of course, because the quantifier operates on the character, and not the content, of the embedded sentence.

As Rabern (2013) notes, it may be argued that, while it is true that Kaplan's LD does contain monsters, they might be regarded as inessential, for they are due to Kaplan's use of the mechanism of variable binding typical of first-order logic. Current semantic theorizing has long abandoned the old Tarskian quantifiers and adopted GQ instead; on this theory, natural language quantifiers are standardly modeled not as variable-binding operators but as higher-order predicates that leave the assignment function untouched. Since there is no need to mention the assignment function in giving a truth-clause for a generalized quantifier, it could be argued that monsters are inessential to Kaplan's framework: he could simply get rid of them by resorting to the standard theory of quantification in natural language.

This solution, however, will not do either, for there is yet another kind of assignment-shifters semantic theory cannot do away with that easily: lambda binders are thoroughly used in any semantic frameworks, more often in combination with GQ. And lambdas have the following semantics:

$$[\![\lambda i.\ \Phi]\!]^{g} = \lambda x.\ [\![\Phi]\!]^{g(x/i)} \qquad \text{(Heim \& Kratzer 1998: 196; Rabern 2013: 399).}$$

In other words, lambdas bind variables, and they do so by shifting a content-generating parameter: the assignment function. For example, an open formula like "Mary read *x*" can, under a certain assignment, have the same content as "Mary read *Hamlet*". But clearly the content of "λx. Mary read *x*" cannot be the same as the content of "λx. Mary read *Hamlet*", no matter which assignment you are assessing them in. Lambdas are essential for a proper treatment of quantification in natural language, so monsters appear to be inevitable. They are, in fact, the mechanism responsible for shifting the content of complex demonstratives in QI-uses.

There is, of course, a possible solution to this puzzle: one could simply add assignments as another parameter of the circumstance of evaluation (cf. del Prete & Zucchi 2017, Nowak 2019b). Kaplan conceives contents as functions from times and worlds to extensions, but in principle there is no reason not to think of them as something more complex – say, a function

from worlds, times and assignments to extensions. If we take this path, then assignment shifters are on a par with modal and temporal operators: they simply shift one of the parameters of evaluation. This means that lambdas and variable binders can be modelled as functions of content. Thus, by adopting a more complex notion of content our system can incorporate the devices that we need to handle quantifications without thereby compromising content-compositionality.[93] This is the general moral that seems to follow from this discussion: "*Given that compositionality of content is desirable, monsters are not. If you discover a monstrous contextual feature, relegate it to the circumstances*." (Westerståhl 2012: 22; see also Stanley 2005).

This solution, however, is at odds with Kaplan's commitment to direct reference. Variables, on his view, are paradigmatic examples of directly referential expressions (1989: 571-573): their content depends on the assignment, but once it has been fixed it is established once and forever and it does not differ from that of a proper name. This is of course impossible to achieve if the assignment function is included as another parameter of the circumstance of evaluation alongside worlds and times, for then the extension of variables will change from circumstance to circumstance. No matter in which context you assess a sentence like (180a): its content could never be about Merkel nor about any other individual. This is the exact opposite of direct reference.

Perhaps giving up direct reference for variables is not that bad. Adding the assignment to the circumstance would affect expressions standardly modelled as variables such as third-person pronouns and certain demonstratives, but we can nonetheless retain a number of expressions that still fit the paradigm of direct reference – for example, first or second person pronouns. But notice, in fact, that the argument is more generalized than it might at first glance seem, for it does not only affect variables: it concerns any shiftable expression. And, in fact, every pronoun displays shifted readings. Consider the following examples, originally due to Heim (2008; see also von Stechow 2003, 2004 and Kratzer 2009):

[93] This also seems to be the reason why Kaplan departs from a classical understanding of propositions as functions from possible worlds to extensions and thinks of them as timeless entities that require a time argument. If contents incorporated time, then temporal operators would be content monsters too. See Richard (1982), Salmon (1989) and Rabern (2012a) for related discussion.

(181) Only I did *my* homework

(182) Few men brought *their* children

(183) We brought *our* children

(181) is ambiguous between a strict and a sloppy reading: if uttered by Mary, it may say either that Mary is the only *x* that did Mary's homework or that Mary is the only *x* that did *x*'s homework. This difference is far from being idle: if Jean does Mary's homework, the strict reading turns out false, but this needn't falsify the sloppy one. On the other hand, if Jean does her own homework, the sloppy reading turns out false, but the strict one may remain true. Things are similar with the other two sentences: (182)-(183) display both bound and free readings. Namely, (182) can be read either as a claim to the effect that, for few men *x*, *x* brought *x*'s child, or as stating that there are a few men that brought the children of whoever "they" refers to; similarly, (183) may mean either that each of us *x* is such that *x* brought her own child, or that we all together brought the children we have in common. These data suggest that all pronouns can be shifted; in fact, they strongly recommend that all pronouns be modelled as variables. If we add the assignment function as part of the circumstance of evaluation, the whole point of *Demonstratives* is rejected: the value of indexicals would shift from circumstance to circumstance. They would therefore be unfit for conveying singular propositions. If, in order to avoid monsters, one packages into circumstances any parameter that can be shifted by an operator, then we end up with a view of indexicals that does not fit Kaplan's central tenet.

There is, however, a way out: we could, simply, embrace monsters. The monster prohibition was grounded on the idea that a single entity, content, was able to play two very different roles within a semantic theory: it can serve as the object of assertion and, at the same time, the level of meaning at which semantic operations take place. But, as Lewis (1980) puts it, we have no reason to think that that this is so:

> "It would be a convenience, nothing more, if we could take the propositional content of a sentence in context as its semantic value. But we cannot. The propositional contents of sentences do not obey the compositional principle, therefore they are not semantic values." (Lewis 1980)

Here, "semantic value" means the object on which meaning operations are defined. What Lewis is advocating for in this passage is a separation of both roles, an idea already endorsed by Dummett (1973): the semantic contribution that an expression makes to the complex expressions containing it need not coincide with its assertoric content, i.e., with the information it communicates. We may want to say, for example, that the assertoric content of the pronoun in (180a) is an individual, but, in order to be able to compositionally determine the meaning of (180b), we must take into account something different altogether. This has led many authors (Lewis 1980; Rabern 2012, 2013; Yalcin 2014; Rabern & Ball 2019) to regard assertoric content (i.e., explicitly communicated content) as a *postsemantic* notion.

A good way to summarize the main point of this section is to define monsters as operators that shift the contribution of an expression to *what is said* (Rabern & Ball, 2019: 401). By conceiving monsters this way, we can retain a notion of content according to which what is said by an expression in a context is simply a function of worlds and times to extensions, but, at the same time, we can account for the shiftiness of the relevant expressions. Informally speaking, allowing monsters means that the contribution of indexicals to what is said will depend on the linguistic environment they are found in: sometimes they will contribute their character, and sometimes their content. (21d) and (21h) are examples of this: the first-person pronoun contributes its customary content to the former, but in the latter a monster intervenes, meaning that in order to arrive at the assertoric content of the whole sentence we must take into account the character of the pronoun.[94]

This is something that holds of pronouns in general, as long as they display bound readings. Applying these ideas to the concrete case of complex demonstratives, this means

[94] This is turn, may serve as a response against Dever's criticism towards c-theories on the basis that these do not respect semantic innocence (cf. section 2.1.3). His argument, recall, was that c-theories predict that the contribution of an expression may vary depending on the linguistic environment in which it is embedded. For example, the word "man" contributes its customary content to what is said by (40), but this content is nowhere to be seen in what (1) asserts:

(1) That man with a hat is bald

(40) A man with a hat came home

This idea can hardly constitute a criticism once the presence of monsters has been acknowledged: the whole point of section 3.3.2.1 is that the lack of semantic innocence is a generalized phenomenon. It means, for example, that a variable will contribute its customary content to what is said by (179a) and its character to (179b). The lack of semantic innocence that Dever attributes to c-theories is something that we already needed to acknowledge if we wanted to make room for the idea that (179a) expresses a singular proposition.

that sometimes we will have to take into account their descriptive meaning – the nominal – in order to determine the assertoric value of the sentences containing them. This is what happens in QI-uses, in which the character of the demonstrative is being quantified into. When there are no monsters around, however, it is possible to retain the idea that the assertoric content of a sentence containing a complex demonstrative can be given by a singular proposition. This is what explains their opacity to modal and temporal operators. The question now is: is this picture compatible with the idea that complex demonstratives are, or can work as, devices of direct reference? Let me briefly discuss this in the next section.

3.3.2.2 Millianism and direct reference

Salmon (2006a, 2006b, 2008) complains, *contra* King (1999, 2001, 2008b) that the existence of QI-uses hardly constitutes an argument against the idea that complex demonstratives, *qua* expressions, are directly referential. His main criticism is that King fails to distinguish between expression types and their particular occurrences: from the fact that there exist non-referential occurrences of demonstratives, King infers a property of these expressions *qua* types, namely that they are not referential. Salmon reconstructs King's argument as a variant of the one Benson Mates (1973: 415) raised against the idea that definite descriptions were singular terms. He calls it the "QI-objection":

> (*K*1) *Any sentence* Φ_β *containing a directly referential occurrence of singular term* β *not within the scope of an indirect, intensional, or quotational operator*[95] *expresses as its semantic content a singular proposition in which the designatum of that same occurrence of* β *occurs as a component.*
>
> *(K2) If a singular term* β *is directly referential, then every occurrence of* β *not within the scope of an indirect, intensional, or quotational operator is a directly referential occurrence.*

[95] The phrase "singular term β not within the scope of an indirect, intensional, or quotational operator" is originally put by Salmon as "singular term β in extensional position". The two formulations are used interchangeably in the original discussion.

(K3) Sentence (77) does not express a singular proposition in which the designatum of the occurrence of the complex demonstrative in it ('that queen who crowned her') occurs as a component.

(K4) Hence by premises K1 and K3, the occurrence of 'that queen who crowned her' in (77) is not a directly referential occurrence.

(K5) Hence by K4 and K2, 'that queen who crowned her' is not directly referential.

Although King claims that this is not exactly the argument he intended to provide in his work, he also admits that he is in full agreement with it (King 2008b: 106-108). Salmon objection is addressed, fundamentally, against premise K2. This is interesting, for what Salmon calls "Mates semantic theorem K" follows from K1 and K2:

(*K*) *Any sentence* Φ_β *containing an occurrence of a directly referential singular term* β *in extensional position, expresses as its semantic content a singular proposition in which the designatum of that same occurrence of* β *occurs as a component.*

In a nutshell (and setting aside a great deal of the details of the original discussion), Salmon argues that K2 – and, for that matter, K – sets the standard for counting as a directly referential expressions too high, to the point of excluding the possibility that variables might be so. The reasons should be clear already. Try applying the very same argument to a formula like (179b):

K1 and K2 as above

(X3) Sentence (179b) does not express a singular proposition in which the designatum of the occurrence of the variable ('x') occurs as a component.

(X4) Hence by premises K1 and X3, the occurrence of 'x' in (179b) is not a directly referential occurrence.

(X5) Hence by X4 and K2, 'x' is not directly referential.

Thus, the premises K1 and K2, paired with uncontroversial facts about the semantics of quantified phrases, entail that variables are not directly referential expressions. Salmon rejects premise K2 on the basis that it entails this undesirable conclusion.

King (2008b: 108-110) regards this as a terminological issue about how to use the term "direct reference". On his view, K2 is fine as it is: it is "true by stipulation" that an expression is directly referential iff all of its occurrences are (King 2008b: 108). This, of course, prevents us from applying the label "directly referential" to expressions like variables, complex demonstratives and pronouns, but he also notes an important point: K2 in no way conflicts with the possibility of directly referential *occurrences* of variables, pronouns and even complex demonstratives. This kind of expressions display both referential and non-referential occurrences, and this is consistent with K2, i.e., with their not being directly referential *qua expressions*.

I essentially agree with King's claim that this is a terminological issue with nothing at stake: regardless of the way we choose to employ the term "direct reference", our theories are still going to make the very same predictions. In fact, I am more inclined to agree with him in regarding K2 as true. This seems to be in full agreement with Kaplan's characterization of direct reference by means Principle 2, repeated below:

> "When what was said in using a pure indexical in a context *c* is to be evaluated with respect to an arbitrary circumstance, the relevant object is *always* the referent of the indexical with respect to the context *c*." (Kaplan 1977: 500; my emphasis)

The use of the word "always" in this fragment suggests that Kaplan had in mind something like K2. On the other hand, Salmon's rejection of the principle also seems to enjoy some exegetical support, for it is grounded on the idea that variables are paradigms of direct reference. Be it as it may, exegetical accuracy is not that important, for, although Kaplan coined the term, it is also true that it has taken on a life of its own. Our current usage need not coincide with Kaplan's, and, more importantly, perhaps the term is best used in another way.

For the purposes of the current discussion, the consequences are also terminological. The acceptance of K2, paired with the existence of monsters, has the consequence that only proper names count as directly referential – QI-uses suffice for excluding the possibility that

complex demonstratives are so, although they may have directly referential occurrences. If, on the contrary, the best way to use the term "direct reference" turned out to be Salmon's, then complex demonstratives, pronouns and variables can count as directly referential even if some of their occurrences are not. Perhaps the latter view could face what many would regard as a problem: it sort of entails relegating the notion of direct reference to the postsemantics, for it is clear that it plays no role whatsoever in the compositional determination of the semantic values of complex expressions.[96]

As Georgi (2012) notes, nothing so far excludes the possibility that complex demonstratives are singular terms, or even Millian expressions. In other words: accepting K2 does not mean that complex demonstratives should be understood as quantifiers. He defines "Millianism" stipulatively as follows: a term *e* is Millian iff every totally free occurrence of *e* is directly referential (Georgi 2012: 386), where "totally free" means "not within the scope of any quantifier".[97] Of course, the argument K1-K5 does not follow if we substitute "directly referential" for "Millian", for then K2 is clearly false. Variables are Millian under this definition, and so might complex demonstratives be.

If we define "Millianism" as Georgi does,[98] an important conclusion follows: the existence of non-referential occurrences of complex demonstratives is hardly an objection

[96] This is something Salmon sets out to solve by means of his "theory of bondage" (2006a, 2006b), which advances an occurrence-based account of binding – a similar proposal is developed by King & Glanzberg (2020). See Pickel & Rabern (2020) for criticisms.

[97] In fact, Salmon ends up characterizing direct reference by incorporating this condition into K2:

> (K2*) If a singular term β is directly referential, then every *totally free* occurrence of β not within the scope of an indirect, intensional, or quotational operator is a directly referential occurrence (Salmon 2006a, 2008; my emphasis).

This simply means that quantifiers are on a par with indirect, intensional and quotational operators. The idea seems essentially right (cf. Neale 2006).

[98] It is unclear whether this is an accurate characterization of Millianism. Under this definition, indexicals are also Millian expressions, but arguably they should not be so, for, even though their contribution to the proposition expressed is just an object, they are also endowed with a descriptive meaning, namely character. Salmon (1998: 311) characterizes the Millian view about an expression *e* as the idea that *e*'s only semantic contribution is a referent, a view that, he claims, is not incompatible with acknowledging that *e* may also have connotational and intensional features, as long as *these are not semantic.* Monsters perform semantic operations on the character of indexicals and variables, and this entails recognizing some sort of semantic role to character – it cannot be conceived, simply, as a rule of use that need not belong to a semantic theory. So perhaps Georgi's characterization of "Millianism" is mistaken.

The discussion is nevertheless interesting. Corazza (2002a), for example, uses the label "Millian" for an account of proper names that is entirely analogous to his theory of complex demonstratives (2002b, 2003); it seems, then, that he would agree that his proposal, and arguably all the approaches presented in 2.1, qualify as Millian. There is nevertheless an important difference between his account of complex demonstratives and other directly

against treating them on the model usually endorsed by c-theorists and mp-theorists. These approaches model complex demonstratives on a par with other indexicals, i.e., as context-dependent expressions whose extension, a referent, can be determined just by looking at the context – unless, of course, a monster intervenes. The theory presented in this dissertation undoubtedly fits the definition of Millianism given above, and so do the directly referential theories from section 2.1.[99] Insofar as Millian theories treat complex demonstratives on a par with variables and other pronouns, they can predict that these expressions may have non-referential readings. But there is an important difference between Millian and quantificational approaches: the former, unlike the latter, predict that non-deictic readings are licensed only in case the demonstrative is under the scope of a monster. This prediction, I shall claim, is what makes Millian theories superior; its relevance shall become clearer in section 3.3.5.2.

Regardless of the question whether my theory counts complex demonstratives as directly referential, it is clear that it does treat them as Millian terms in Georgi's sense. It therefore retains the central virtues of c-theories: it offers a very simple semantics able to account for the facts about opacity and entailment in a straightforward manner by relegating the semantic role of the nominal to character. And each of the uses that do not fit this model are explained as cases in which an operator of character intervenes. Insofar as we are justified in lifting Kaplan's ban (and the evidence from the examples in (180)-(183) suggests we are), this traditional model can be vindicated as the best explanation of the behavior of complex demonstratives in different linguistic environments.

referential approaches, particularly Borg's (2000) and Dever's (2001): on his view, the descriptive meaning associated with a complex demonstrative does not play any logical role – an idea that the later Braun (2008a) seems to agree with (see footnote 11). This idea is importantly Millian. See also García-Carpintero (2000, 2018) and Predelli (2016).

[99] Since my circumstance-binding solution (and, in some cases, even the extensional one) counts some complex demonstratives as circumstance-dependent, counting my theory as Millian might seem like a mistake – it is for this reason that I provide a new definition of the term by the end of section 3.3.5.2. At any rate, recall that what makes complex demonstratives circumstance-dependent is that they are being quantified into by an external operator. Their content in a context, when they are outside the scope of monsters, is still an object. For the record, this just stresses an important feature of my framework and, more generally, of theories that allow object-language quantification over times and worlds: the so-called "intensional operators" are actually hyperintensional in such system. This point will be central in the discussion of attitude reports in section 3.3.5.2.

3.3.3 Bound variable uses

The discussion in the last section points towards a conclusion: complex demonstratives are better understood on the model of pronouns, i.e., as context-dependent singular terms whose only role is to pick out an object from the context. If context gets shifted, it is no surprise that they fail to single out a unique object. The analogy with personal pronouns provides a straightforward way to deal with one of the problematic counterexamples pointed out by King: complex demonstratives that function as bound variables. Recall the above example:

(90) [Every student]$_1$ has a professor who thinks [that student]$_1$ is smart

I do not see the necessity to devote much space to this kind of uses. The first thing to be noted is that, while it is true that the complex demonstrative as it occurs in (90) is not directly referential, bound variable uses are perfectly consistent – and very naturally fitting – with an understanding of complex demonstratives on the model of pronouns. After all, every personal pronoun, even first-personal ones, displays bound readings, as the data in (180)-(183) show. These examples motivated the standard variabilist semantics for pronouns, which includes not just "he" and "she" but also first and second-personal ones. Recall the standard lexical entry for third-person pronouns that we stated above (conveniently modified so as to take into account the idea that assignments are a part of contexts):

(145) For any $n \in \mathbb{N}$, $[\![She_n]\!] = \lambda c: g_c(n)$ is a female. $g_c(n)$

Giving a variabilist semantics for other pronouns is not difficult. A pronoun like "I" can be modelled in the same manner (cf. Kratzer 2009; Santorio 2010, 2012; Yalcin 2019):

(184) For any $n \in \mathbb{N}$, $[\![I_n]\!] = \lambda c: g_c(n) = a_c$. $g_c(n)$

This semantics allows the lambdas to shift the value of "I" in a context, as required by sentences like (181). Since variable binders operate on the assignment function, they bear effects on the character of the pronouns under their scope, so it is no surprise that these fail to single out a unique individual. Of course, the semantics of lambdas should be slightly modified in order to accommodate Φ-featural agreement, or, in other words, in order to deal with the descriptive part of the meaning of the pronoun (*being a female* in the case of

"she").[100] If we understand complex demonstratives on the model of pronouns (i.e., as variables of some sort) and their descriptive material as analogous to Φ-features, our semantic theory already has the resources to handle bound variable uses. Here I discuss several ways to achieve the right results.

The easiest and most conservative option is to modify the semantics for object-language lambdas in order to make them operate on the δ functions too. In section 3.1.2 I introduced syntactic indexing for complex demonstratives, a feature that I have been omitting throughout the whole discussion on QI for simplicity's sake. It is now the time to re-introduce it into our semantics: let each context *c* be supplied with indefinitely many δ functions δ_c^1 … δ_c^n …, and let complex demonstratives have the semantics in (147a), repeated below:

(147a) For each $n \in \mathbb{N}$, $[\![[\text{that F}]_n]\!] = \lambda c.\ \delta_c^n([\![F]\!]^c)$

Binding can be achieved, simply, by letting lambdas operate on the δ functions. The following syncategorematic lexical entry will do:

(185) For any natural number *n* and context *c*, $[\![\lambda n.\ \Phi]\!]^c = \lambda x.\ [\![\Phi]\!]^{c(x/n)}$, where "c(x/n)" is the context that is just like c except that $g_{c(x/n)}$ assigns *x* to *n* and, for any complex demonstrative "$[\text{that F}]_n$" occurring free in Φ, $\delta_{c(x/n)}^n$ assigns *x* to $[\![F]\!]$.

Let us see how (185) deals with (90). Its (simplified) logical form should look like this (setting aside, for simplicity's sake, temporal and modal dependence):

(90a) [Every student] λ1. [a professor who thinks [that student]$_1$ is smart] λ2. r_1 has r_2

Here is the calculation:

---

[100] Although the case of "I" is a complex one (see Kratzer 2009, Santorio 2012, Yalcin 2019 for some difficulties), the case of "she" can be easily handled. Heim and Kratzer (1998: 125) achieve this by implementing the following modification into the rule for object-language lambdas:

> If α is a branching node whose daughters are β_n and γ, where β is a relative pronoun or "such", and $n \in \mathbb{N}$, then for any variable assignment g, $[\![\alpha]\!]^g = \lambda a$: a ∈ E and γ is in the domain of $[\![\ ]\!]^{g(x/n)}$. $[\![\gamma]\!]^{g(x/n)}$.

This principle ensures that the presuppositional material from the right node γ will be passed on to the upper node α: if γ = "she$_1$ is happy", then the domain of "λ1. she$_1$ is happy" will be restricted to females. This system does not yield the right results for first-person pronouns, and at some point I shall abandon it in favor of another, currently more widely accepted way to achieve these results: Heim's (2008) principle of Feature Transmission Under Binding (or, alternatively, Arnim von Stechow's (2003, 2004) Feature Deletion Under Binding). I shall discuss this principle in section 3.3.5.2.

1. $[\![(90a)]\!]^c = 1$ iff

2. $\forall x$ (x is a student $\rightarrow \lambda y.$ $[\![$[a professor who thinks [that student]$_1$ is smart] $\lambda 2.$ r_1 has $r_2]\!]^{c(y/1)}$ (x) =1) iff

3. $\forall x$ (x is a student $\rightarrow \lambda y. \exists z$ ($[\![$professor who thinks [that student]$_1$ is smart$]\!]^{c(y/1)}$ (z) = 1 & $\lambda a.$ $[\![r_1$ has $r_2]\!]^{c(y/1)(a/2)}$ (z) = 1) (x) = 1) iff

4. $\forall x$ (x is a student $\rightarrow \lambda y. \exists z$ ($[\![$professor who thinks [that student]$_1$ is smart$]\!]^{c(y/1)}$ (z) = 1 & y has z) (x) = 1) iff

5. $\forall x$ (x is a student $\rightarrow \lambda y. \exists z$ (z is a professor and z thinks $\delta_{c(y/1)}{}^1$ ($[\![$student$]\!]^{c(y/1)}$) is smart & y has z) (x) = 1) iff

6. $\forall x$ (x is a student $\rightarrow \lambda y. \exists z$ (z is a professor & z thinks y is smart & y has z) (x) = 1) iff

7. $\forall x$ (x is a student $\rightarrow \exists z$ (z is a professor & z thinks x is smart & x has z))

Of course, this way of meddling with the character of the demonstrative is different form the way we handled QI. In QI-uses we operated on the character of the demonstrative by modifying the property that the δ function had to combine with; here, it is δ itself that is being shifted. The mechanism is different, yet the results are (unsurprisingly) similar: in both cases we get a non-deictic reading.

There are, of course, formal alternatives to the above syncategorematic entry. A less conservative option is, simply, to treat δ functions as part of the assignment. This can be achieved by letting each assignment function range not just from natural numbers to individuals but, additionally, from pairs consisting of a property and a natural number to individuals satisfying that property. I.e., each assignment *g* should be defined as a function $\mathbb{N} \cup \mathbb{N}x\Pi \rightarrow E$, under the condition that, for each context *c* and pair <n, P> in the domain of g_c (where $n \in \mathbb{N}$ and $P \in \Pi$), $P(g_c(<n, P>))(i_c) = 1$. Now all we have to do is to make each occurrence of a complex demonstrative "[that F]$_n$" in c pick out $g_c(<n, [\![F]\!]>)$, thus:

(147f) For each $n \in \mathbb{N}$, $[\![$[that F]$_n]\!] = \lambda c.$ $g_c(<n, [\![F]\!]^c>)$

And here is a non-syncategorematic version of (147f):

(147g) ⟦that⟧ = λc. λP. λn: n ∈ ℕ. g(<n, P>)

The latter is, in fact, my favorite way to formulate the lexical entry for complex demonstratives. Now the semantics for object-language lambdas can be simplified:

> For any natural number *n* and context *c*, $[\![\lambda n.\ \Phi]\!]^c = \lambda x.\ [\![\Phi]\!]^{c(x/n)}$, where "c(x/n)" is the context that is just like c except that $g_{c(x/n)}$ assigns *x* to *n* and, for any property P, $g_{c(x/n)}$ assigns *x* to <*n*, P>.

I believe that placing the referents of complex demonstratives in the assignment function is a step in the right direction. On my view, contexts, *qua* formal parameter, are redundant: if pronouns, tenses and moods can all be modelled as variables that can be handled by means of an assignment function, it is unclear what theoretical work contexts are doing. Surely, context is supposed to represent some features of the setting in which an utterance takes place, but the determination of the contextual parameters pertaining to a certain speech situation is far from straightforward and, at any rate, not a matter of semantics proper (see Predelli 2005, Stalnaker 2014, Ball 2017, Rabern & Ball 2019 and Yalcin 2019 for some discussion on the notion of *context* its role within semantic theory). This means that perhaps semantics would better do away with the notion of *context*, a label has induced a great deal of confusion on the aims and scope of semantic theorizing (Predelli 2005), and adopt a context-free semantics (Santorio 2019).

But context is, after all, just a formal parameter for generating content, and this means that it is still possible to retain this notion and achieve the right results. For example, another formal alternative is to retain the old sequences of demonstrata that Braun (1996) and Salmon (2002) so thoroughly criticized. We could, for each property P, build into each context *c* a sequence $S^{cP} = <d^{cP}_1 \ldots d^{cP}_n \ldots>$, with the condition that each of the members of S^{cP} should satisfy P. Then we could make "that" combine with a property Q and a natural number *m* and pick out, for each context *k*, the *m*th member of S^{kQ}, i.e., d^{kQ}_m. Then lambdas should be defined to operate on sequences of demonstrata. The difference with the above options is merely terminological.

Before moving on to discuss further counterevidence, let me discuss a closely related point, one that bears on ideas already presented by Corazza (2002b). Understanding complex demonstratives on the model of pronouns, as I have been advocating throughout this

dissertation, has an interesting consequence: it allows us to simplify our lexical inventory of indexicals by treating the latter as a particular case of the former. For example, "he" and "she" could be understood as a shortened form of "[that male]" and "[that female]", respectively; similarly, we can regard "now" and "here" as shortenings of "[this moment]" and "[this place]". And the mechanism for binding pronouns could be, simply, the same one that we might want to choose in order to bind complex demonstratives.

This would allow us to reduce our lexicon and would therefore make room for a simpler semantics, although it also has its drawbacks. For example, treating "she" as a shortened form of "that female" would straightforwardly make sentences like (186) valid, but the idea that it expresses an analytic truth is not uncontroversial (see footnote 67):

(186) She is a female

Additionally, this idea could be harder to implement for other indexicals like "I" or "you", for the descriptive meaning of these seems to differ from that of "he" and "she" in important ways. But, on the other hand, the idea of treating indexicals in this manner enjoys some etymological plausibility, since, from a diachronic point of view, many indexicals developed from shortened forms of complex demonstratives – this is true particularly in the domain of temporal adverbials. Let me just mention some examples, most of which come from Romance philology. The word "now" in Portuguese and Spanish, "*agora*" and "*ahora*" respectively, derives from the Latin complex demonstrative "*hac hora*", meaning "this time". Similarly, the word "today" in most Romance languages ("*hoy*" in Spanish, "*hoje*" in Portuguese, "*avui*" or "*hui*" in Catalan, "*oggi*" in Italian,) is a contraction of the Latin complex demonstrative "*hoc die*", which just means "this day". Catalan and Occitan contain indexicals for referring to the current year, "*enguany*" and "*ogan*" respectively, and they derive from the Latin locution for "this year" ("*hoc anno*"). Other similar etymologies include the German word for "today", "*heute*", which presumably derives from Old German "*hiu tagu*" ("this day"), and one of the Japanese words for "then", "*sonotōki*", literally "that time".

Of course, this is just a suggestion yet to be explored. For the moment, I hope to have convinced the reader that the classical treatment of complex demonstratives in no way

conflicts with the fact that they display bound variable readings. On the contrary, it reveals that complex demonstratives are to be understood as variables, i.e., as context-dependent singular terms whose character is analogous to that of other indexicals.

3.3.4 E-type anaphora

The results in sections 3.3.1.3 and 3.3.3 suggest that the classical model of complex demonstratives has the resources for dealing with many of the counterexamples presented by its critics. Complex demonstratives can be understood just like any other indexical, i.e., as context-dependent singular terms whose only role is to pick out an object; non-deictic readings can, for the most part, be regarded as instances of monstrous quantification into their character. This idea, however, seems hard to implement for anaphoric uses of complex demonstratives like the one in (83), in which the term lies outside the scope of any quantifier, or by Bach-Peters sentences like (82a-b), in which QI is present but clearly cannot be the whole story:

> (82a) Every friend of yours who studied for it passed that exam she was dreading
>
> (82b) That friend of yours who studied for it passed some exam she was dreading
>
> (83) **A student$_1$** was sitting in the library. **Another student$_2$** was sitting across from **her$_1$**. **That student$_2$** had a logic book.

These are tough cases, but, as we shall see, they are as problematic for complex demonstratives as they are for any other pronoun. In a nutshell, my argument is this: they are instances of E-type anaphora, and they can be dealt with by means of Evans's (1977a, 1977b) classical analysis or some variant of it. For the purposes of discussion, I will be using the terms "Millian" and "directly referential" interchangeably, neglecting the considerations in section 3.3.2 and the idea that these labels may not be straightforwardly applicable to my theory.

Let me illustrate the phenomenon of E-type anaphora by discussing (83). King's objection, recall, goes as follows: if "that student" were a directly referential term, it should refer to someone; let us say it is Bob. In that case, this succession of sentences would be true in a world in which Bob has a logic book, a student is sitting in the library and another student,

different from Bob, is sitting across from her. It seems, then, that a theory that treats complex demonstratives as directly referential terms gets the truth conditions of (83) wrong.

This objection is tricky. A good way to see why it fails to show what it purports to is to focus on the first two sentences:

> (83a) **A student$_1$** was sitting in the library. Another student was sitting across from **her$_1$**.

Focus on the pronoun "her", almost uncontroversially considered as a directly referential term. Who is the referent of "her" on this occasion? Let's say it's Laura. In that case, these two sentences are true at a world in which a student other than Laura is sitting in the library and another student is sitting across from Laura in, say, a coffee shop. This is wrong for the very same reasons as above. Yet very few would reject treating "her" as a directly referential term. Notice, in fact, that the very same argument could be constructed using only pronouns (Swanson 2005, Braun 2008c):

> (83b) **A student$_1$** was sitting in the library. **Another student$_2$** was sitting across from **her$_1$**. **He$_2$** had a logic book.

What went wrong here? In fact, the parallelism between all these examples just highlights the close semantic similarity between pronouns and complex demonstratives: both kinds of expressions can display what Evans (1977a, 1977b) would have called an "E-type anaphoric reading". As stated above, I will appropriate Evans's label for referring to this kind of problematic anaphora, but this need not be understood as an endorsement of his positive proposal. Essentially, E-type pronouns are pronouns anaphoric on a quantifier that for syntactic reasons cannot be treated as bound variables, but nevertheless display co-variation with their antecedent. This phenomenon is paradigmatically exemplified by so-called "donkey anaphora":

> (187) Every farmer who owns [some donkeys]$_1$ vaccinates them$_1$
>
> (188) If Jean owns [a donkey]$_1$, she vaccinates it$_1$

These examples were already problematic for the logicians of the Middle Ages (cf. Burleigh 1328/1955), and they were presented by Peter Geach (1962) as an argument against

Montagovian semantics. Evans originally formulated his proposal as a response to Geach. Examples like (83), on the other hand, are sometimes called "discourse anaphora", and they are often discussed in conjunction with donkey anaphora, for both seem to be instances of the same general phenomenon, E-type anaphora, which can be identified by means of a very simple syntactic criterion. Namely, it occurs whenever there is a pronoun π such that

1) π is anaphoric on a quantifier Q
2) Q does not c-command π
3) π does not c-command Q

As for the semantics of this kind of pronouns, the matter is more controversial.[101] The so-called "E-type analysis", pioneered by Evans himself, treats them as referential pronouns whose reference is fixed by a definite description obtained from their antecedent; let me call this analysis "Evans approach", in order to avoid confusion with E-type anaphora in general. Other authors, most notably Neale (1990a, 1990b) and Heim (1990), prefer to say that these pronouns go proxy for that very definite description – i.e., they are not referential. Accordingly, analyses of the latter kind are usually called "D-type". Since both Evans's approach and D-type analyses attribute a central role to definite descriptions in dealing with problematic anaphora, they are often grouped together under the label "description-theoretic approaches". Other authors remain skeptical towards the idea that pronouns can sometimes function as definite descriptions, for such idea entails implicitly acknowledging that pronouns (*all* pronouns in *all* languages) are ambiguous expressions. Instead, they have developed alternative theories, such as Groenendijk and Stokhof's (1991) Dynamic Predicate Logic (DPL) or several approaches within the framework of Discourse Representation Theory (DRT), like those by Kamp (1981) or Heim (1982). These proposals often go by the name "dynamic approaches".

I am not sure which of these strategies is the right one and, in spite of my use of the label "E-type", I shall remain neutral about them throughout this dissertation – E-type anaphora is one of the most discussed topics in contemporary semantics, and taking sides for one theory or the other would require examining a vast amount of evidence that falls far beyond the scope of the current work. All I intend to show here is that the problems raised

[101] See Elbourne (2005: §1) for an overview of all the different proposals.

by E-type anaphora are not harder when it comes to complex demonstratives than they are for personal pronouns. Let me briefly review the way that each of the theories would deal with E-type complex demonstratives.

Description-theoretic approaches assume that sentences containing E-type pronouns are roughly equivalent to the result of substituting the relevant pronoun for a (perhaps referential) definite description. Of course, not any description will do; we must restrict the analysis some way or another in order not to overgenerate. The usual assumption is that the appropriate description is to be obtained by identifying the smallest clause in which the quantifier antecedent is inserted and converting it into a definite description (see Neale 1990a: 182-183 and footnote 102 below for details). Applying this analysis to the above examples, we obtain the following:

(187a) Every farmer who owns some donkeys vaccinates *the donkeys she owns*

(188a) If Jean owns a donkey, she vaccinates *the donkey Jean owns*

As stated above, it is not clear what this equivalence amounts to. This descriptive content may either fix the reference or be directly incorporated into the truth-conditions of the sentence. Whatever the details, this treatment of pronouns accounts for the right truth-conditions of a sentence like (83a), containing discourse anaphora. The prediction is that the semantic value of "she" can be arrived at by means of a description like the one in (83c):

(83c) **A student** was sitting in the library. Another student was sitting across from **the student who was sitting in the library**.

C-theories understand complex demonstratives on the model of pronouns, so they predict that they may also be subject to this kind of readings. If this is so, then the complex demonstrative "that student" in (83) is a candidate for such reading, for it has a quantifier antecedent that neither c-commands it nor is c-commanded by it:

(83d) **A student** was sitting in the library. Another student was sitting across from **the student who was sitting in the library**. **The student who was sitting across from the student who was sitting in the library** had a logic book.

If E-type pronouns go proxy for their associated descriptions, as in the D-type analysis, then (83) is just equivalent to (83d). Evans's approach, on the other hand, would have "that student" be a singular term whose reference is fixed by the description. Both analyses are compatible with acknowledging some sort of semantic role for the nominal "student" attached to the demonstrative, pretty much like they acknowledge a semantic role for the Φ-features of "her" in (83a). Just as the female features of "her" restrict the domain of quantification to females, it could be argued that the role of the descriptive meaning of "that student" is to restrict it to students.

Now, it could be argued that Evans's approach, which treats the personal pronoun "her" and the demonstrative "that student" as referring terms, is still subject to the same problems as above: if the former refers to Mary and the latter to Bob, then (83d) is true at any world *w* in which a student is sitting in the library, another one is sitting across from Mary and Bob has a logic book, regardless of the whereabouts of Mary and Bob in *w*. But this objection presupposes that the relevant description is simply the one displayed in the superficial form of (83d). The description is to be retrieved from the *LF*, and not the superficial form, of the smallest clause in which the quantifier antecedent of the pronoun is inserted, and this LF may contain explicit references to a certain world and time, as in the system I have advocated for in section 3.3.1.2. For example, (83a) could receive an LF like the following, where the underlined sentence is the smallest well-formed clause containing the quantifier antecedent of the pronoun "her":

(83e) $\underline{[\exists t_2 : t_2 < t_1^{pres}]\ (<w_0^{ind}, t_2>\ \text{A student is sitting in the library})}$.

$[\exists t_3 : t_3 < t_4^{pres}]\ (<w_5^{ind}, t_3>$ Another student is sitting across from $\underline{\text{her}})$.

This means that "her" should be interpreted as a referring term whose reference is fixed by something like the following description: "*the x such that* $[\exists t_2 : t_2 < t_1^{pres}]$ *(x is a student sitting in the library in* $<w_0^{ind}, t_2>$*)*". And this yields the right result:

(83f) $[\exists t_2 : t_2 < t_1^{pres}]\ (<w_0^{ind}, t_2>$ A student is sitting in the library).

$[\exists t_3 : t_3 < t_4^{pres}]\ (<w_5^{ind}, t_3>$ Another student is sitting across from *[the x such that* $[\exists t_2 : t_2 < t_1^{pres}]$ *(x is a student sitting in the library in* $<w_0^{ind}, t_2>$*)]*)

I.e., this sequence of sentences will always have to be interpreted in the same world and time: those picked out by the indicative mood and present tense. Of course, this very

same analysis can be applied to the E-type complex demonstrative in the third sentence of (83). If we interpret the demonstrative as a referring term whose reference is fixed by the description obtained from the clause in which its antecedent is inserted (underlined below), then we can account for the right truth-conditions of (83):

(83g) $[\exists t_2 : t_2 < t_1^{pres}]$ ($<w_0^{ind}, t_2>$ A student is sitting in the library).

$[\exists t_3 : t_3 < t_4^{pres}]$ ($<w_5^{ind}, t_3>$ Another student is sitting across from [the x such that $[\exists t_2 : t_2 < t_1^{pres}]$ (x is a student sitting in the library in $<w_0^{ind}, t_2>$)])

[The y such that $[\exists t_3 : t_3 < t_4^{pres}]$ (y is a student sitting across from [the x such that $[\exists t_2 : t_2 < t_1^{pres}]$ (x is a student sitting in the library in $<w_0^{ind}, t_2>$)] in $<w_5^{ind}, t_3>$) had a logic book

Although a bit unwieldy, this system correctly predicts that "that student" and "her" will have to pick out a referent in the same circumstance, namely that of the context, and that their value will depend on the quantifier that serves as their antecedent. Of course, this system can also be made compatible with the idea that the E-type pronouns have to pick out a different object in each circumstance of evaluation; all we need to do is to make the same manoeuvre by means of which we implemented the circumstance-binding solution, i.e., to add lambdas binding the indicative and present variables within each sentence. This would include the variables within the description, and it would turn the E-type pronouns circumstance-dependent. Discourse anaphora should therefore be no more problematic for complex demonstratives than it is for any other pronoun.

It is of course also possible to devise donkey anaphoric complex demonstratives:

(189) Every farmer who owns a donkey beats *that donkey*

Applying the usual analysis to (189) should not constitute any problem: it would yield (189a) as a result:

(189a) Every farmer who owns a donkey beats the donkey she owns

This shows that donkey anaphora, just like discourse anaphora, is not more problematic for complex demonstratives than it is for pronouns. There is, in fact, yet another puzzle for which description-theoretic approaches to E-type anaphora have proven successful: Bach-

Peters sentences (cf. Jacobson 1979, Neale 1990a, Heim & Kratzer 1998: §11). Consider the following classical examples:

(190) Every boy who deserved **it** got the prize **he** wanted

(191) The pilot who shot at **it** hit the MiG that chased **her**

The problem with Bach-Peters sentences, recall, is that it is impossible to achieve a reading in which both pronouns are c-commanded (and therefore bound) by the quantifiers that serve as their antecedent. The usual solution is to interpret one of these pronouns as bound and the other one as E-type; in the above examples, the latter analysis should be applied to "it". Omitting time and world variables for simplicity's sake, here is the (simplified) LF we arrive at (as above, it is unclear whether the bold material should be interpreted as an actual definite description or as a reference-fixing description that is ultimately not incorporated into the truth-conditions of the sentence): [102]

(190a) [Every boy who$_1$ r_1 deserved **the price he$_1$ wanted**] $\lambda 2$. r_2 got the price he$_2$ wanted

(191a) [The pilot who$_1$ r_1 shot at **the MiG that chased her$_1$**] $\lambda 2$. r_2 hit the MiG that chased her$_2$

The truth-conditions of these LF's are rather transparent and need no further explanation. The situation is not different when complex demonstratives come into play:

(82a) Every friend of yours who studied for **it** passed that exam she was dreading

(82b) That friend of yours who studied for **it** passed some exam she was dreading

In (82a), "it" is anaphoric on "that exam she was dreading", and none of these terms c-command each other; this means that "it" is a candidate for an E-type interpretation. Now, it may in principle seem a bit unhappy on my part to suggest that we can interpret "it" as E-

[102] Notice that the resolution of the E-type anaphora in (190a)-(191a) differs from the other sentences above. In general, it is common to assume a distinction like the following (Neale 1990a: 182-183): if a pronoun π is anaphoric but not c-commanded by a quantifier "DF" resulting from the concatenation of a determiner "D" and a predicate "F", and the smallest clause containing "DF" is "DF is G", then π is interpreted either as "the F which is G" in case "D" is a *nonmaximal* determiner or as "the F" in case "D" is *maximal*. A determiner "D" is maximal just in case "DF is G" entails "all F's are G", and nonmaximal otherwise; for example, "the", "every", "each" and "all" are maximal, whereas "some", "most" and "a" are not. This means that determiners of the former kind trigger a simpler interpretation when it comes to donkey anaphora. The pronoun "it" in (190a)-(191a) follows this simpler pattern, for its anaphoric antecedent is a quantifier introduced by "the".

type, for that would require the pronoun to be anaphoric on a quantifier, and I have been arguing that complex demonstratives are singular terms. I believe nevertheless that an E-type interpretation for "it" should be licensed in this case, for, although I disagree with King and other authors on the idea that complex demonstratives should be semantically interpreted as quantifiers, I do find myself in full agreement with the (on the other hand uncontroversial) idea that, from a purely syntactic point of view, they are determiner phrases. And, importantly, the criterion for identifying an E-type pronoun and carrying out the appropriate analysis is *syntactic*, and not semantic (if you are dissatisfied with this answer, I suggest an alternative below). Here is the LF we obtain once E-type anaphora has been resolved:

(82c) [Every friend of yours who$_1$ r_1 studied for **the exam she$_1$ was dreading**] λ2. r_2 passed that exam she$_2$ was dreading.

This LF should make it clear that the non-rigidity of this demonstrative is once again due to monstrous quantification into its nominal. This means that Bach-Peters sentences can be reduced to a combination of E-type anaphora and QI. The case of (82b) is a bit more complex, but it is essentially another instance of the same phenomenon. Notice first that "some exam she was dreading" must be raised for type reasons, which means that the problematic pronoun here is not "it" but rather "she":

(82d) [Some exam which$_1$ **she** was dreading g_1] λ2. That friend of yours who studied for it$_2$ passed r_2

And interpreting "she" in the right manner yields the right truth-conditions:

(82e) [Some exam which$_1$ **[the friend of yours who studied for it$_1$]** was dreading r_1] λ2. that friend of yours who studied for it$_2$ passed r_2

Or, in plain (although cumbersome) English, "some exam which the friend of yours who studied for it was dreading is such that that friend of yours who studied for it passed it". So this is a case of QI too.

Now, it is possible to object to this analysis on the basis that, if the demonstrative is not a quantifier, then the E-type analysis cannot be applied. This is a fair worry, but I have an alternative. Geach (1962) suggested that some pronouns could simply go proxy for their

anaphoric antecedent – for this reason, he called them "pronouns of laziness". This works paradigmatically well in the case of proper names:

(192) Some friend of yours who was looking for *her* managed to find *Mary*

Substituting "her" for its antecedent "Mary" straightforwardly yields the right interpretation:

(192a) Some friend of yours who was looking for *Mary* managed to find Mary

Sentences (192) and (192a) show that pronouns anaphoric on referential expressions can be understood as pronouns of laziness that simply go proxy for their antecedents.[103] If this is the case, then the pronoun "it" in (82a) can go proxy for the complex demonstrative; thus, what we end up with is another case of QI:

(82f) [Every friend of yours who$_1$ r_1 studied for **that exam she$_1$ was dreading**] $\lambda 2$. r_2 passed that exam she$_2$ was dreading.

The fact that we can quantify into this particular pronoun of laziness is unsurprising, since, unlike the one in (192a), it is anaphoric on a syntactically complex expression. This is the alternative analysis I can provide in case you are not satisfied with the idea that a pronoun anaphoric on a complex demonstrative can receive an E-type interpretation.

This was just a rough and very preliminary sketch of how description-theoretic approaches can deal with discourse anaphoric and donkey anaphoric complex demonstratives. Although I provided several alternatives, I did not intend this overview as an exhaustive one; any account E-type anaphoric complex demonstratives should be made in connection with a more general account of this kind of anaphora, one that should also include

[103] In fact, this kind of sentences are often used as evidence for the idea that definite descriptions are singular terms instead of quantifiers; consider the following contrast, in which (192') apparently patterns with (192) instead of (192''):

(192') ^{OK} Some friend of yours who was looking for him$_1$ managed to find [the man who murdered Smith]$_1$

(192'') ? Some friend of yours who was looking for him$_1$ managed to find [every man who murdered Smith]$_1$

I believe, with Neale (1990a: 211-213), that this contrast shows nothing. Consider the following sentence, containing an uncontroversial quantifier:

(192''') ^{OK} Some friend of yours who was looking for him$_1$ managed to find [a man who murdered Smith]$_1$

This simple example shows that the acceptability of (192') has nothing to do with the alleged non-quantificational status of the definite description.

pronouns in general. All I wish to show is that treating complex demonstratives as another type of pronoun can accommodate all the counterevidence presented by King and other authors. And this treatment, of course, includes both the possibility of operating on the character of the pronouns and that of giving them an E-type interpretation.

Dynamic accounts of E-type anaphora, such as those developed in the context of DPL or DRT, avoid resorting to descriptions, for that would imply treating pronouns as ambiguous expressions – a very systematic ambiguity, but ambiguity after all. They nevertheless would count (83) as true in roughly the same situations as (83d). One account I am particularly attracted to is DPL, which models all pronouns as variables but allows quantifiers to bind items outside their syntactic scope. If we treat complex demonstratives as variables, as suggested in section 3.3.3, then DPL can account for E-type anaphoric complex demonstratives. Consider the discourse anaphora in the following sentence:[104]

(193) A woman was walking in the park. She whistled.

The meaning of (193) can be captured by the following first-order logic formula:

(194) ∃x (Wx & Px & Hx),

where "W", "P" and "H" stand, respectively, for "being a woman", "walking in the park" and "whistling". The problem with (194) is that it clearly does not capture the *syntax* of its natural-language counterpart. The syntactic makeup of (193) resembles more that of the following formula, in which the third occurrence of *x* lies beyond the scope of the quantifier:

(194a) ∃x (Wx & Px) & Hx

But fixing the syntax in this manner leaves us with the opposite problem, for, of course, (194a) does not capture the meaning of (193). DPL is devised to solve this mismatch; as we shall see, it allows the third occurrence of *x* in (194a) to be bound. This is achieved thanks to two semantic innovations from DPL: it conceives the meaning of formulae as pairs of assignments and it attributes a very peculiar to role logical connectives, namely that of, very

[104] A nice summary of the main tenets of DPL can be found in Elbourne (2005: 13-19).

roughly, passing to the formula on the right the set of assignments determined by the one on the left. Let us see this in more detail.

DPL shares the syntax of first-order logic, but conceives the meaning of formulae as pairs of assignments, where assignments can be thought of as if they were contexts of utterance. The idea behind this semantics is a Stalnakerian one: the meaning of a sentence is to be modelled as the effects it induces on the context. More formally, the meaning of a formula Φ is modelled in DPL as the set of pairs <g, h> such that an occurrence of Φ in *g* would leave an assignment *h* as a possible representation of how things are. For example, the meaning of an atomic formula can be modelled as follows:

(195) $[\![Rt_1 \ldots t_n]\!] = \{<g, h> \mid g = h \ \& \ <[\![t_1]\!]^h, \ldots [\![t_n]\!]^h> \in I(R)\}$,

where I(R) is the interpretation of the predicate "R". Intuitively speaking, an atomic formula leaves the assignment untouched, but it eliminates those assignments that fail to satisfy the formula. The meaning of "Fx", for example, will consist of every pair of assignments <g, h> such that $g = h$ and $g(x)$ has the property denoted by "F"; in other words, it eliminates any assignment k such that $k(x)$ does not satisfy the relevant property. So far nothing too new. The dynamic effects are achieved thanks to the behavior of quantifiers and, more importantly, logical connectives:

(196) $[\![\exists x \ \Phi]\!] = \{<g, h> \mid \exists k$ (k differs from g in at most the value that it assigns to x & $<k, h> \in [\![\Phi]\!])\}$

(197) $[\![\Phi \ \& \ \Psi]\!] = \{<g, h> \mid \exists k \ (<g, k> \in [\![\Phi]\!] \ \& \ <k, h> \in [\![\Phi]\!])\}$

Informally, the idea is that an existentially quantified formula takes as input an assignment *g* and returns the assignments *h* such that 1) *h* differs from *g* except for the object they assign to the bound variable, and 2) *h* satisfies the embedded formula. On the other hand, the role of a conjunction linking any two formulae Φ and Ψ is to take the set of assignments that Φ leaves as output and to pass them on so that they can serve, in turn, as inputs for Ψ. This has the effect that, when co-joining a quantified formula with an open one, any quantifier in the former will be able to bind free variables within the latter. It is easy to check that, with

the semantics just provided, (194) and (194a) are equivalent[105] (see Groenendijk & Stokhof 1991: 47-48 for a fuller explanation). Switching back to natural language, DPL predicts that the following sentences are synonyms:

(193) A woman was walking in the park. She whistled

(193a) A woman was walking in the park and whistling

This analysis is devised mostly for personal pronouns, but it is not hard to extend it to complex demonstratives, whose behavior I have been analogizing to pronouns in general. As I pointed out in the previous section, my account is compatible, and very naturally fitting, with treating (193) and (193b) as synonymous:

(193) A woman was walking in the park. She whistled

(193b) A woman was walking in the park. *That woman* whistled

If "that woman" can be understood as a variable, as I suggested in the previous section, there should be no obstacle to analyze (193b) as synonymous with (193) and (193a). In turn, DPL could acknowledge some role to the Φ-features of "she", and the very same role could

[105] I did not want to disturb the reader with the details of the calculation, but, just in case you want to check it, here it is. Let us first calculate the semantic value of (194a) (essentially the same calculation as the one in Elbourne 2005: 14-15):

1. ⟦∃x (Wx & Px) & Hx⟧ = {<g, h> | ∃k (<g, k> ∈ ⟦∃x (Wx & Px)⟧ & <k, h> ∈ ⟦Hx⟧)} (by (197))
2. = {<g, h> | ∃k (<g, k> ∈ {<g', k'> | ∃k'' (k'' differs from g' in at most the value it assigns to x & <k'', k'> ∈ ⟦Wx & Px⟧)} & <k, h> ∈ ⟦Hx⟧)} (by (196))
3. = {<g, h> | ∃k ∃k' (k' differs from g in at most the value it assigns to x & <k', k> ∈ ⟦Wx & Px⟧ & <k, h> ∈ ⟦Hx⟧)} (by reduction)
4. = {<g, h> | ∃k ∃k' (k' differs from g in at most the value it assigns to x & ∃j (<k', j> ∈ ⟦Wx⟧ & <j, k> ∈ ⟦Px⟧ & <k, h> ∈ ⟦Hx⟧))} (by (197) and reduction)
5. = {<g, h> | ∃k ∃k' (k' differs from g in at most the value it assigns to x & ∃j (k' = j & j(x) ∈ I(W) & j = k & k(x) ∈ I(P) & k = h & h(x) ∈ I(H)))} (by (195))
6. = {<g, h> | h differs from g in at most the value it assigns to x & h(x) ∈ I(W) & h(x) ∈ I(P) & h(x) ∈ I(H)} (by reduction and the definition of "=")

It is easy to check that we arrive at the same results with (194):

1. ⟦∃x (Wx & Px & Hx)⟧ = {<g, h> | ∃k (k differs from g in at most the value that it assigns to x & <k, h> ∈ ⟦Wx & Px & Hx⟧)} (by (196))
2. = {<g, h> | ∃k (k differs from g in at most the value that it assigns to x & <k, h> ∈ {<k', h'>| ∃k'' ∃k''' (<k', k''> ∈ ⟦Wx⟧ & <k'', k'''> ∈ ⟦Px⟧ & <k''', h'> ∈ ⟦Hx⟧)})} (by (197))
3. = {<g, h> | ∃k (k differs from g in at most the value that it assigns to x & ∃k' ∃k'' (<k, k'> ∈ ⟦Wx⟧ & <k', k''> ∈ ⟦Px⟧ & <k'', h> ∈ ⟦Hx⟧))} (by reduction)
4. = {<g, h> | ∃k (k differs from g in at most the value that it assigns to x & ∃k' ∃k'' (k = k' & k'(x) ∈ I(W) & k' = k''& k''(x) ∈ I(P) & k'' = h & h(x) ∈ I(H)))} (by (195) and reduction)
5. = {<g, h> | h differs from g in at most the value it assigns to x & h(x) ∈ I(W) & h(x) ∈ I(P) & h(x) ∈ I(H)} (by reduction and the definition of "=")

be attributed to the nominal of a demonstrative. Notice, in fact, that it is not necessary to buy the whole pack of DPL in order to carry out this sort of analysis: the whole framework that I have been employing throughout this dissertation (a combination of Kaplan's (1977) and Heim and Kratzer's (1998)) could be made dynamic in exactly the same way simply by adapting the lexical entries for lambdas, quantifiers and connectives in an appropriate manner and by treating every indexical as assignment-dependent rather than context-dependent. The use of first-order logic is inessential to a DPL-style approach. There is, of course, something profoundly anti-Kaplanian in this idea: the connectives employed by DPL operate on assignments, and therefore on the character of expressions; they would therefore count as monsters if incorporated into the current framework. But this shouldn't be a big deal once all the facts about monsters that I discussed in the three previous sections have been acknowledged.

I hope to have been able to convince the reader that the existence of E-type anaphora poses no threat to the classical analysis of complex demonstratives – at least no greater that the challenge it poses for the traditional treatment of pronouns in general. The phenomena discussed in this section are in fact perfectly compatible with Millianism in Georgi's sense and perhaps with direct reference (see the discussion in 3.3.2.2), for none of them prevent us from modelling the problematic demonstratives as referential terms or, alternatively, as variables – unless, of course, the right analysis turned out to be the D-type approach, which models them as definite descriptions in disguise.

Before moving on to the refutation of the next piece of counterevidence against c-theories, let me briefly discuss some data that suggest that the best way to conceive complex demonstratives is as variables. As Borg (2000: 248, footnote 14) pointed out, donkey readings are often unavailable for bare demonstratives but perfectly acceptable for complex ones:

(198a) ^{OK}I bought [a donkey]$_1$ and had [that donkey]$_1$ vaccinated.

(198b) #I bought [a donkey]$_1$ and had [that]$_1$ vaccinated

This is interesting, for the very same pattern is found in bound variable readings. Namely, bare demonstratives, unlike the complex ones, often resist binding[106] (Nowak 2019b; the numbering of these examples is slightly altered):

(143a) ^{OK}[Every IKEA kit]$_1$ comes with instructions for assembling [that kit]$_1$.

(143b) #[Every IKEA kit]$_1$ comes with instructions for assembling that$_1$.

These two contrasts highlight the great similarity of complex demonstratives and pronouns, for the latter also display both E-type anaphoric and bound readings:

(143c) ^{OK}[Every IKEA kit]$_1$ comes with instructions for assembling it$_1$.

(198c) ^{OK}I bought [a donkey]$_1$ and had it$_1$ vaccinated

In short, here is my argument: the facts in (143a-c) suggest that complex demonstratives and pronouns, but not bare demonstratives, display the behavior typical of variables. If we examine the facts in (198a-c) under the light of those in (143a-c), a hypothesis suggests itself: perhaps E-type anaphora can only occur when variables are involved. If this were so, we would have a straightforward explanation for the infelicity of (198b): E-type anaphora can be considered as a special case of binding, as in the DPL approach, and the fact that bare "that" cannot be bound is, simply, because it is not a variable. Alternatively, we could argue that bare "that" is also a variable that for some reason resists binding (see the discussion in 3.1.2), and still maintain E-type anaphoric pronouns are nothing but bound pronouns. This is all still very speculative, but, if it turned out to be right, it would yield support to the DPL approach. The Evans-style approach, on the other hand, is also compatible with these ideas: being a referring term whose reference is fixed by description is not incompatible with being a variable.

The data analyzed up until now suggests that all the counterevidence can be reduced to either a case of monstrous quantification into the character of the pronoun (either by means of QI or through a bound variable reading) or an instance of E-type anaphora; in fact, notice

[106] For some reason, it is much easier to get an anaphoric reading when the bare demonstrative is plural (Maclaran 1982, Roberts 2002):

(w) The Russians had allowed [few pieces from their collection]$_1$ to go on show, but these$_1$ were the highpoint of the exhibition

that, if we treat E-type anaphora as proponents of DPL suggest, then it turns out that all types of counterevidence are due to the presence of monsters. None of these two categories of non-deictic readings pose a greater threat to c-theories of complex demonstratives than they do to the traditional analysis of pronouns. There is, however, another type of counterevidence yet to be discussed: NDNS-readings. In the next section I set out to show that these also be seen as special cases of one the two unproblematic categories of counterevidence.

3.3.5 Two possible ways to account for NDNS

NDNS-readings of complex demonstratives occur when the speaker does not have any particular object in mind nor performs any sort of ostensive gesture that could guide us in finding the intended referent. At first sight, these data do not seem as conclusive as QI-uses or anaphoric readings, for two reasons: on the one hand, they rely on epistemological intuitions that not everybody needs to share and, on the other, many of these cases fail to distinguish whether the intuitions are generated by the semantics of the term or by some kind of pragmatic phenomena – King (2001) does provide some arguments against pragmatic accounts of NDNS, but I shall argue below that they are ultimately defective. Let us nevertheless assume, for the argument's sake, that our intuitions towards these examples are stable and, in fact, a reliable source of evidence for their semantics;[107] even if it were so, it still does not follow that they cannot be accounted for by traditional approaches.

C-theories, I have been arguing, are compatible with the idea that complex demonstratives display non-deictic uses, as long as these are due to the presence of monsters or E-type anaphora. And it is plausible to assume that many NDNS-uses can be reduced to particular instances of these two phenomena. By the end of section 3.3.1.3 we saw that (89) can be seen as an instance of QI; similarly, there should be no obstacle in analyzing (86) as a case of discourse anaphora:

> (86) Although it's clear that we need **[someone]$_1$** to dig us out of the hole we are in, I doubt Dany is **[that hero]$_1$**

[107] Arguably they are not. See the arguments by Hermann Cappelen (2012).

"That hero" is not c-commanded by its anaphoric antecedent "someone", and therefore it is a candidate for being subject to some of the analyses we reviewed in the former section. For example, this sentence could be understood as (86a) below, perhaps restricting the range of *x* to just heroes:

(86a) Although it's clear that we need **[someone]$_1$** to dig us out of the hole we are in, I doubt Dany is **[the *x* such that *x* digs us out of the whole we are in]$_1$**

Notice, in fact, that the circumstance-binding solution has the required resources for counting (84)-(85), repeated below, as cases of QI:

(84) That student who scored one hundred on the exam is a genius

(85) That hominid who discovered how to start fire is a genius

On this account, a sentence like (84) should be given the following LF and truth-conditions (for simplicity's sake, let me treat "scoring one hundred on the exam" as if it were a syntactic unit, just as I have been doing throughout the whole dissertation):

(84g) $\lambda<w_0, t_1>.$ $<w_0, t_1>$ That student who$_3$ $[\exists t_2 : t_2 < t_1]$ ($<w_0, t_2>$ R_3 scores one hundred on the exam) is a genius

(84h) $\lambda c.\ \lambda i.$ $\underline{\delta_c(\lambda x.\ \lambda j.$ there is a time *t* occurring before t_i such that x is a student in $<w_i, t>$ and x scores one hundred on the exam in $<w_i, t>)}$ is a genius in i)

Here, of course, the circumstance argument *j* taken by the δ function is vacuous, and therefore the demonstrative is not sensitive to the circumstance of the context. As (84h) makes clear, the whole sentence will be true in a world *w* if a certain individual is a genius in *w* , where of course that individual is required to be a student in *w* and to score one hundred on the exam in the very same world. Analogous facts hold for (85). In other words, these two sentences are as circumstance-dependent as they would have been had we used "the" instead of "that".[108] King's intuitions towards NDNS-uses should therefore pose no threat to the circumstance-binding solution, for most of them come out as another case of QI.

[108] Notice, in fact, one fundamental difference between my account and King's. Imagine a world *w*' in which two students, Mary and Bob, scored one hundred on the exam, and both of them are geniuses there. King K3

The extensional solution is not able to handle NDNS in semantic terms, but it is nevertheless far from resourceless, for the possibility of resorting to pragmatics in order to explain why the demonstratives in these examples strike us as non-rigid is always open (cf. Braun 2008). As mentioned above, intuitions are not entirely reliable and it is perfectly possible to claim that, even though (84)-(85) have the truth-conditions of a singular proposition, they can nevertheless be employed for implicitly communicating general propositions. Pragmatic accounts are rejected by King on the basis of the way NDNS-sentences embed under the scope of attitude verbs and other modal operators, but, as we shall see in the next section, his arguments ultimately fail. Thus, pragmatics is the first possible way to account for NDNS, as I argue in section 3.3.5.1. And, in fact, I have yet a second possible solution to the problem of NDNS, just in case one rests dissatisfied with an appeal to pragmatics: in spite of what it might *prima facie* seem, the extensional solution is able to predict the right embedding of NDNS-uses under modals. Finally, I devote another section to presenting some preliminary crosslinguistic evidence in favor of analyzing NDNS-uses in these terms.

3.3.5.1 Pragmatics and Frege cases

The very name "no demonstration, no speaker reference" for which "NDNS" stands suggests that the solution is to be sought in the pragmatics. Bearing in mind Kripke's (1977) distinction between semantic reference and speaker reference, it is perfectly plausible to

predicts that (84) is false in w', for it expresses (84f), repeated below (I am omitting time-dependence for simplicity's sake):

> (84f) λw. ∃x (x is a student who scored one hundred in *w* & x is a student who scored one hundred in *w* & ∀y (y is a student who scored one hundred in *w* & y is a student who scored one hundred in *w*) → x=y) & x is a genius in *w*)

The truth of (84f) requires there to be a unique student who scored one hundred, and this excludes the possibility that it be true in w'. My account, on the other hand, predicts that it is. Given any context *c*, δ_c(λx. λw. x is a student in w' and x scored one hundred on the exam in w') can only take either Mary or Bob as values and, since both of them are geniuses in *w*', the whole sentence will be true there. Now consider a world w'' in which both Bob and Mary scored one hundred but only Mary is a genius. King predicts, again, that (84f) is false in w'', for the same reasons as above. My account, on the other hand, predicts that the truth-value of (84) is context-dependent: it will be true in a context *c* if δ_c(λx. λw. x is a student in w'' and x scored one hundred on the exam in w'') picks out Mary and false if it picks out Bob. I take this to be a reflection of the idea that the truth of this sentence depends on several contextually-determined facts: our degree of accuracy, our will to take certain individuals and not others into account, etc.

assume that NDNS cases may arise in spite of the fact that complex demonstratives are referring expressions – a similar argument might be found in Corazza (2003: 267-272). This can be brought to light by constructing scenarios similar to the ones King presents, but using different singular terms. Consider the exchange in (199):

(199) Teacher: "You performed very poorly on this exam, Greg. It was not so difficult: there is a student who scored one hundred on it."
Greg: "**She** must be a genius."

Arguably, Greg did not demonstrate or intend to refer to any particular individual when he employed the pronoun highlighted in bold. The latter is a singular term, and any sentence containing it expresses a singular proposition, yet Greg seems to be conveying something on purely general grounds. Of course, he could have uttered "that student is a genius" instead. We would not take this scenario as evidence that "she" is not a singular term, and it is therefore dubious that our intuitions regarding this kind of examples can be conclusive about the alleged non-referential status of complex demonstratives or any other expression. Now, it is possible to argue that this example is tricky: the pronoun, as used by Greg, seems to involve discourse anaphora. Namely, it is anaphoric on the quantifier "a student who scored one hundred" and can therefore be given an E-type analysis, which would account for the non-rigidity of the term. But King's original example seems to involve no E-type anaphora. He presents it thus:

> SITUATION A: Two days after a very complicated exam, Greg overhears his teacher telling to a fellow workmate that a student scored one hundred on it. Later on (perhaps several days later), Greg, who still has no clue who that student might be, is reflecting in solitude about the difficulty of the exam. He thinks (84) to himself.

Excluding the possibility of very long-distance discourse anaphora,[109] it seems that the complex demonstrative in this example cannot be interpreted as E-type, yet Greg manages to

[109] It is possible to argue that even examples like (84) and (85) do involve some sort of anaphoric dependence. This is, in fact, the way Elbourne (2008) deals with these examples: on his view, these are cases in which the speaker does demonstrate something, namely the very utterance announcing the existence of a student who scored one hundred. He goes on to develop a theory of indexicality pretty much like the one developed by

convey to himself a non-singular thought. Notice, in fact, that substituting (84) in this situation for another sentence containing a pronoun (say, "she must be a genius") would completely alter the example, for nothing would ensure that Greg manages to convey what he intends to. In SITUATION A, Greg performs no ostensive gesture, does not intend to speak about anybody in particular and has no anaphoric antecedent at hand, and yet manages to convey to himself a general thought by means of a complex demonstrative. This is not the case of the conversation in (199), where anaphora does seem to occur.

It is nevertheless possible to construct scenarios in which speakers manage to convey general thoughts by uttering sentences containing non-anaphoric singular terms unaccompanied by any gesture nor referential intention. Suppose that Greg is looking at a sheet displaying the percentages of scores of the students – how many of them scored between 10 and 20, how many of them scored between 80 and 90, etc. No names are displayed.[110] From that document, Greg may infer that there is exactly one student who scored one hundred, and he may express his admiration by uttering (200):

(200) **She** must be genius

In this scenario Greg does not have any particular individual in mind, and, unless we employ very loose notions of demonstration or anaphora, it seems clear that neither of these occurs. Yet he is able to use a singular term for conveying a purely general thought. This

---

Nunberg (1993), devised for dealing with *deferred reference* (Quine 1969: 194; see also Borg 2002). On these theories, the referent of an indexical need not coincide with the *demonstratum* ("index" in their terminology); rather, the role of the demonstratum is to help settle what the actual referent is by means of a contextually determined relation – I am using the term "referent" loosely here, for strictly speaking demonstratives never refer to an object in Elbourne's system. Thus, (84) can be analyzed as a case of deferred ostension in which the demonstrated object is the original utterance itself and the ultimate value is settled by selecting an individual suitably related to that utterance. Demonstrating the utterance, in turn, can be regarded as a kind of anaphora.
I basically accept Elbourne's idea that NDNS-uses may be analyzable in a manner analogous to cases of deferred reference. Other analyses along these lines may be found in Georgi (2012) and Corazza (2003), the latter without resorting to Nunberg-style machinery. Reasons of space prevent me from discussing these theories at length, but I am in general lines sympathetic to their main tenets.
Elbourne argues that, in fact, there is an important source of evidence in favor of this kind of analyses: distal features. For example, a sentence like (84*) sounds acceptable in case the utterer heard the relevant sentence just a few seconds ago:

(84*) *This* student who scored one hundred on the exam is a genius

This fits nicely with Elbourne's idea that the speaker's intended demonstratum is an utterance. When the relevant utterance has just happened, it is perfectly felicitous to employ (84*), whereas in a scenario like the one in SITUATION A, in which the utterance happened long ago, only (84) is acceptable.

[110] I am grateful to Jordi Valor for suggesting this formulation of the scenario. The original example involved elements that could be taken to be equivalent to proper names for each student.

kind of examples would not lead us to see pronouns as non-referring expressions, and SITUATION A should not lead us to conclude that complex demonstratives are not to be understood on the traditional model.

King, however, does not treat SITUATION A as conclusive. On his view, the most decisive case against direct reference is the evidence from attitude reports. Consider the following contrast:

(84a) Greg believes that that student who scored one hundred on the exam is a genius

(84b) Greg believes that Mary is a genius

In principle, the directly referential theorist predicts that, if Mary is the student who got the maximum score, these two sentences should express the very same proposition (see the next section, though). This idea may enjoy some initial plausibility, for, if I know about Mary's performance, I may employ (84b) for reporting Greg's belief, even if he knows nothing about her. However, so the argument goes, our intuitions regarding these two sentences are not quite the same, for (84b), unlike (84a), is not uncontroversially true: whether it counts as true or false depends on our interests, the degree of accuracy required by the context, etc. Consider the following scenario:

> SITUATION B: Mary is in fact the student who scored one hundred on the exam, and Bob knows it. He also knows that Greg does not hold Mary in high regard. When Bob is in his way back home, he accidentally overhears Greg's utterance of (84) when he was talking to himself in SITUATION A. Later on, Jean and Bob are talking about how good Mary is at doing everything, and he utters (84b).

It is not clear whether Bob's utterance should count as true or false, for it will depend on a plethora of factors. But things are different with (84a), for this sentence is always true in the situation described, regardless of our interests or degree of accuracy. On King's view, this is a fact that is straightforwardly explained if the proposition contributed by the embedded sentence is general, instead of singular.

As above, the problem with King's argument is that it is always possible to reproduce this kind of scenarios employing only singular terms. Consider the following situation:

> SITUATION C: Mary's life has just been saved by Spider-Man. She is back home reflecting on her own about Spider-Man's deeds, and she exclaims to herself "Spider-Man is the best superhero!". Unbeknownst to her, Gwen, who knows that Spider-Man is in fact Peter Parker, overhears Mary's utterance.

Gwen may choose to report Mary's belief by means of one of these two utterances:

(201a) Mary believes that Spider-Man is the best superhero

(201b) Mary believes that Peter Parker is the best superhero

Just as in SITUATION B, (201a) is an uncontroversially correct way to report Mary's beliefs, whereas (201b), although perfectly appropriate in some situations, may also be misleading in others. Consider now a slight variation of this scenario in which Mary did not utter "Spider-Man is the best superhero" but, rather, "that superhero is the best superhero" while pointing at a photograph of Spider-Man. Even though she has employed a complex demonstrative, Gwen's utterance of (201a) is still uncontroversially accurate. These examples suggest that SITUATION A, just like SITUATION B, is nothing but a variant of the classic Frege problem concerning the interchangeability of "Hesperus" and "Phosphorus" (Frege 1892/1981b).

It is nevertheless still possible to doubt that situations B and C are entirely analogous. After all, there is an important difference between Greg and Mary: the latter may not know that Spider-Man is Peter Parker, but she nevertheless has singular thoughts about Spider-Man. Nothing in Greg's example should lead us to suppose that he has singular thoughts about anybody; if Greg has not introduced any singular term in his language of thought, then it is no surprise that (84a), but not (84b), is uncontroversially true in SITUATION A. And the explanation we can provide of its truth is different from the one we can offer for the appropriateness of (201a) in SITUATION B.

The problem with this kind of scenarios is, of course, that it is always possible to come up with another example in which we reproduce the very same intuitions. Let us come back

to the scenario in which Greg learns that exactly one student scored one hundred by looking at an anonymized sheet in which the percentages of the scores are displayed. Suppose that Gwen overhears Greg uttering (200). Later, while she and Fred are taking a look at the very same sheet, the following exchange takes place:

(199a) Fred (*pointing at the percentage of students who scored one hundred*): "Have you seen this?"

Gwen: "Yes. Greg thinks that **she** is a genius."

Just as in SITUATION A, we have no reason to think that any of the characters in this story have any singular thoughts whatsoever about any particular individual. Yet Gwen may perfectly employ a singular term, "she", for reporting Greg's attitudes. The situation is entirely analogous to King's example, and it does not show that "she" should be treated any differently than most theories do. Notice, in fact, that the very same intuitions can be reproduced even for proper names. I personally have intuitions of non-rigidity regarding sentences with descriptive names (Evans 1979):

(202) Inspector Lestrade wants to arrest Jack the Ripper

Arguably, inspector Lestrade's wish is not about any individual in particular; this particular report is compatible even with Lestrade being the only person in London who thinks that the infamous murders were the work of more than one person – thus excluding the possibility that he may have singular thoughts about the criminal. Yet we may use an uncontroversial rigid designator, a proper name, for reporting such attitude. If Lestrade's case does not show that proper names are not rigid designators, Greg's scenarios should not show anything about complex demonstratives either. As I see it, this should teach us to view with suspicion the idea that our intuitions in this kind of scenarios should constitute evidence about the semantics of our terms. Taking these examples too seriously would ultimately lead us to revise well-established semantic paradigms on the basis of non-conclusive intuitions. Rather, what they show is that our intuitions fail to tell semantic facts apart from appropriateness at a pragmatic level.

I have nevertheless yet another answer against King's challenges. Even if his claims about indirect speech were right, the theory defended here is compatible with the idea that

the complex demonstratives in his examples are transparent to attitude verbs. This is, in fact, something very natural on any theory employing explicit quantification over worlds and times. I explain why in the next section.

3.3.5.2 Fregeanism regained: von Stechow's theory of verbal quantifiers

Consider the following LF, to be revised, for (84a):

(84c) $<w_0^{ind}, t_1^{pres}>$ Greg believes $<w_2^{ind}, t_3^{pres}>$ that student who$_4$ [$\exists t_6$: $t_6 < t_5^{pres}$] ($<w_7^{ind}, t_6 > R_4$ score one hundred on the exam) is a genius

The verb "believe" is an intensional operator, meaning that it should combine with the intension of a sentence. The problem with the current system is that it is extensional and, unless some further adjustments are made, the embedded sentence in (84c) does not denote an intension, but rather a truth-value: given a context *c*, it denotes truth if δ_c(λx. λj. there is a time t occurring before t_c such that x is a student in $<w_c, t>$ and x scored one hundred on the exam in $<w_c, t>$) is a genius in i_c, and falsity otherwise. The verb "believe" does not combine with truth values, but with intensions, and this means that (84c) is still uninterpretable. The natural way to achieve the right results in this kind of systems is to model attitude verbs as contributing an object-language lambda abstractor that binds the world and time variables of the sentences under their scope: "believe", for example should be translated into LF "believe $\lambda<w_n, t_m>$", where *n* and *m* are natural numbers (cf. von Stechow 2003, 2004). This lambda may bind the circumstance variables under its scope, and this means that, when it combines with the sentence it operates on, the whole construct denotes an intension. This intension can already combine with the verb "believe". That is why attitude verbs are often referred to as "verbal quantifiers" in the framework of these theories. Here is the revised LF:

(84d) $<w_0^{ind}, t_1^{pres}>$ Greg believes $\lambda<w_2, t_3>$. $<w_2^{ind}, t_3^{pres}>$ that student who$_4$ [$\exists t_6$: $t_6 < t_5^{pres}$] ($<w_7^{ind}, t_6 > R_4$ score one hundred on the exam) is a genius

Notice, however, that this cannot yet be the whole story. As long as the variables w_2 and t_3 are marked with the indicative and present features, we are still stuck: the combination of the lambda and the sentence will yield an intension, but this intension is still constant across circumstances, for this sentence is equivalent to saying "Greg believes that that student

who *actually now* scored one hundred on the exam is *actually now* a genius". We therefore need a way to make the world and time variables in the embedded clause range over the whole set of circumstances without thereby abandoning the idea that verbs in indicative and present contribute variables suitably related to the actual circumstance. The standard way to achieve this is by means of an important principle first postulated by Heim (2008) under the name "Feature Transmission Under Binding" ("FTUB" from now on) and later renamed "Feature Deletion Under Binding" by von Stechow (2003, 2004). Let us see what this principle consists in.

Essentially, this principle states that, regardless of their morphological shape, bound variables are always semantically unrestricted, i.e., they *never* have Φ-features at LF. This means that, semantically, a bound "she" is not different from a bound "he". Their different phonetic realization is the result of *feature transmission*: at the level of phonetic form (PF), bound pronouns inherit the Φ-features of their associated quantifiers. Recall the examples (181)-(183), and consider the closely related sentence (203):

(181) Only I did *my* homework

(182) Few men brought *their* children

(183) We brought *our* children

(203) The boys each think that *they* are alone in the room

As stated above, (181) displays both strict and sloppy readings: it may mean either that a_c is the only *x* that did a_c homework or that a_c is the only *x* that did *x*'s homework. On the latter reading, "my" is not first-personal at all: it does not pick out the agent of any context – it is not even a referring expression –, and this means that it should not be restricted to ranging over agents. The pronoun "their", as it occurs in (182), is morphologically plural, but it is nevertheless supposed to range over each of the men *individually*, instead of as a collectivity. (183) has two readings: on one of them, each of us *individually* brings her own children; on the other, we bring children we have in common. The former of these readings seems to be in conflict with the fact that "their" is plural. The very same phenomenon can be observed in (203), where "they" is supposed to be a bound variable ranging over each of the boys individually in spite of being plural from a morphological point of view. In all these cases

there is an important mismatch between the superficial form of a pronoun and its semantic interpretation, for they function as bare bound variables ranging over all individuals, regardless of the Φ-features of the pronoun (i.e. they are not restricted to ranging over pluralities nor the agents of some context).

FTUB is devised to solve this mismatch. Basically, it states that, at the level of PF, bound variables inherit the Φ-features of their associated quantifiers, but these features are nowhere to be found at LF. So, for example, a variable bound by a lambda introduced by a plural phrase like "few men" will always be phonologically realized as a plural pronoun, like "they" or "their". This means that the features of bound pronouns will always display gender, person, number and so on at the phonological level, but these features will never receive any semantic interpretation. The reason why this principle is interesting for dealing with our problem with (84d) is that, in a system like the current one, in which verbal morphology is treated as something entirely analogous to pronouns, FTUB can be applied to the variables contributed by verbs: if a variable is bound by a verb in present, then it will be phonologically realized as a present morpheme in spite of being semantically interpreted as an unrestricted bound variable. This is the way von Stechow (2003, 2004) deals with problems analogous to (84d). Consider the following (and, finally, correct) LF:

(84f) $<w_0^{ind}, t_1^{pres}>$ Greg believes $\lambda<w_2, t_3>$. $<w_2, t_3>$ that student who$_4$ [$\exists t_6$: $t_6 < t_5^{pres}$] ($<w_7^{ind}, t_6 > R_4$ score one hundred on the exam) is a genius

Here, the variables w_2 and t_3, contributed by the verb "to be", are bound by a lambda contributed by "believes", and they display no features (i.e., they are unrestricted). Since the latter verb is in the present tense and indicative mood, FTUB ensures that any variable it binds will be superficially realized as a present and indicative morpheme, regardless of its semantic interpretation. It is for this reason that the verb "to be" surfaces as "is", its indicative and present form, in spite of not making any explicit reference to the actual world nor the present time at the semantic level. (84f) is true in a context *c* iff, for all circumstances *i* compatible with what Greg believes in i_c, the referent of the complex demonstrative is a genius in *i*:

(84g) λc: in all circumstances *i* compatible with what Greg believes in i_c, δ_c (λx. λj. there is a time t occurring before t_c such that x is a student in $<w_c, t>$ and x scored one hundred on the exam in $<w_c, t>$) is a genius in *i*

We have therefore solved the problem with (84f): now the variables are not restricted to the actual world and present time in spite of their morphological shape. On the truth-conditions displayed in (84g), Greg believes an intension, and more concretely a *singular proposition* about one particular individual selected by the context, namely δ_c *(λx. λj. there is a time t occurring before* t_c *such that x is a student in* $<w_c, t>$ *and x scored one hundred on the exam in* $<w_c, t>$*)*. More concretely, his belief consists of the set of circumstances in which this particular individual is a genius.

Notice, however, that this is not the only possible LF predicted in the current system. The complex demonstrative in (84a) contains a relative clause whose verb also displays morphology, and more concretely past tense and indicative mood inflection. And there are two possible explanations that a system incorporating FTUB may provide for such morphological shape: either the variables it contributes are associated with their own present and indicative features,[111] as in (84g), or they are bound by a higher verbal quantifier in the relevant tense and mood, namely "believes":

(84h) $<w_0^{ind}, t_1^{pres}>$ Greg believes $\lambda<w_2, t_3>$. $<w_2, t_3>$ that student who$_4$ $[\exists t_6: t_6 < t_3]$ $(<w_2, t_6 > R_4$ score one hundred on the exam) is a genius

Thus, the current theory predicts that (84a) is ambiguous between two LF's: (84f) and (84h). And the consequences of allowing the latter LF should be clear: the attitude verb is quantifying into the complex demonstrative. Namely, the lambda contributed by the former is binding a variable internal to the latter, with the result that the complex demonstrative is not opaque to modal quantification any more. Here are the truth-conditions obtained by (84h):

[111] Recall from the discussion in 3.3.1.2 that verbs, regardless of their tense and mood, *always* contribute present and indicative variables. This is necessary in order for the other tenses and moods to be defined in relation with the basic ones. This means that the verb "scored" contributes a present variable regardless of the fact that it is in past tense. This is also true in case we treated tenses referentially (cf. von Stechow 2003, 2004).

(84i) λc: in all circumstances *i* compatible with what Greg believes in i_c, δ_c (λx. λj. there is a time t occurring before t_i such that x is a student in $<w_i, t>$ and x scored one hundred on the exam in $<w_i, t>$) is a genius in *i*

This means that the function δ will pick out a different individual in each of Greg's belief circumstances. Given a context *c*, (84i) attributes to Greg a belief consisting in the set of circumstances j such that δ_c *(λx. λi. there is a time t occurring before* t_j *such that x is a student in* $<w_j, t>$ *and x scored one hundred on the exam in* $<w_j, t>$*)* is a genius in j. Of course, δ_c will have to pick out, for each circumstance *j* in Greg's belief set, a student having scored one hundred in the world of *j* and a moment previous to the time of *j*. Thus, the complex demonstrative does not remain unaffected by the presence of the verbal quantifier. Fregeanism has been regained, and it has been reduced as a special case of QI.

Needless to say, this accounts for the intuitive difference between (84a) and (84b) in SITUATION B. Even if one rejects an explanation on pragmatic grounds, it is nevertheless possible to treat complex demonstratives on the model of other indexicals and yet predict a semantic difference between those two sentences. Let *k* be the context of SITUATION B, i.e., a context in which Mary scored one hundred. It is clear that, in spite of her performance on the exam in i_k, (84i) is not about Mary: it will be true in k iff Greg believes the set of circumstances i such that the individual selected by δ_k for the property of scoring one hundred in i is a genius in i. This means that the actual circumstance i_k plays no role in determining the value taken by the demonstrative. Notice, on the other hand, that (84a) can also display a deictic reading, namely the one in (84f-g), in which the verbal quantifier binds no variable within the complex demonstrative. Given that δ_k *(λx. λi. there is a time t occurring before* t_k *such that x is a student in* $<w_k, t>$ *and x scored one hundred on the exam in* $<w_k, t>$*)* = Mary, when interpreting (84f) in *k* we do obtain a singular proposition about Mary: that Greg believes that Mary is a genius. Thus, the current theory predicts that (84a) is ambiguous between a deictic and a non-deictic reading. Obviously, a proper name like "Mary" contains no variables, meaning that verbal quantifiers can bear no effect on it; this entails that (84b), unlike (84a), is not ambiguous, for it can only be equivalent to the deictic reading of (84a) in *k*, i.e., to (84g),

More generally, the current theory predicts that complex demonstratives in intensional contexts can display both deictic and non-deictic readings. The latter typically arise in settings like the one described in SITUATION B, whereas the former can also be brought to salience in some scenarios. Consider the following setting:

> SITUATION D: Greg is not aware that there is any student who scored one hundred on the exam – in fact, he does not even know that an exam has taken place. He nevertheless believes, for independent reasons, that Mary is a genius. Jim knows Mary pretty well, he is aware of Greg's opinion about Mary and he knows she scored one hundred on the exam, but for some reason he is unable to remember her name. While Jim and Jean are discussing the results of the exam, he utters (84a).

As above, our intuitions regarding these examples are far from conclusive, but in principle it seems that this situation favors reading (84a) as expressing a singular proposition, namely the one in (84g). Other scenarios are more favorable to non-deictic readings.

This means that my account is able to generate the very same differences predicted by King's K3, but, unlike him, I do not need to rely to any *ad hoc* restriction on the set of contexts, and I do not resort to controversial issues pertaining to the metaphysics of intentions, such as the idea that haecceitistic properties are always accompanied with the higher-order property J_1. My account, on the contrary, predicts that the non-deictic readings are licensed only if a set of well-defined linguistic criteria are met. In other words, this concession to Fregeanism does not mean that non-deictic readings are ubiquitous – this is another fundamental difference between my account and King's. Recall the following example:

(11) Mary believes that that bald man has hair

As stated above, this sentence is not ambiguous, for it is not possible to read it as attributing a contradictory reading to Mary (cf. Braun 1994 for discussion of very similar examples). My account is able to accurately predict this lack of ambiguity; here are the only possible LF (11) can have and the truth-conditions it yields:

(11c) $\langle w_0^{ind}, t_1^{pres}\rangle$ Mary believes $\lambda\langle w_2, t_3\rangle$. $\langle w_2, t_3\rangle$ that bald man has hair

(11d) λc: in all circumstances *i* compatible with what Mary believes in i_c, δ_c (λx. λj. x is a man in j and x is bald in j) has hair in *i*

This time, the complex demonstrative contains no variables whatsoever, and therefore cannot be quantified into by any external quantifier: in a context *k* such that δ_k *(λx. λj. x is a man in j and x is bald in j)* = John, this sentence will attribute to Mary belief in a singular proposition, namely the set of circumstances in which John has hair (which, of course, does not include the actual circumstance, in which he is bald). Fregeanism is therefore not unrestricted, for it only concerns complex demonstratives containing a relative clause – a fact that fits very naturally with the contrast first noted by Wolter (2006) and Nowak (2019a) and discussed in section 3.3.1.3. This also means that my theory is not subject to the modal problems that Braun (2008b, 2008c) raises against King's (2001) account (see the end of section 2.2.1.3). Just for the sake of illustration, consider the contrast between the following sentences (Nowak 2014):

(88b) Every girl is looking for that boy who makes her heart beat faster, her stomach flutter and her mind wander

(88c) Every girl is looking for that boy

The default reading of (88b) is *de dicto*: none of the girls need to have any particular boy in mind. Of course, it may also be read *de re*, say, in a scenario in which each of the girls is playing hide and seek with her own actual current boyfriend. The verb "look for" does not combine with propositions, but at any rate it does require intensions as its argument, and this means that it should perform some sort of quantification over worlds and times, which in turn means that it is able to bind the world and time variables within the complex demonstrative in (88b). Just as in the above examples, the *de dicto* and *de re* readings are obtained, respectively, by letting the variables be bound or free. But, of course, this is not possible for (88c), where the complex demonstrative contains no world and time variables. This accounts for the fact that it can only be read as expressing a *de re* proposition to the effect that each of the girls is looking for a certain individual: for some context *c*, if d_c(λx. λj. x is a boy in j) = Greg, then (88c) can only mean that every girl is looking for Greg. As far as I can tell, no

other theory of complex demonstratives, except for Nowak's (2019a), is able to predict a contrast between (88b-c).

A possible criticism against my account is that, in spite of examples like (11) and (88b-c), perhaps Fregeanism should nevertheless be unrestricted. King seems to have something like this in mind when he discusses what he calls "*non-redundant NDNS uses*", i.e., NDNS-readings in which the property determined by the speaker's intentions differs from the property specified by the nominal of the demonstrative. One of King's (2001) examples concerns two astronomers that have been able to determine that one night in the year 100 A.D. the Earth passed through an asteroid belt, resulting in a very nice display of shooting stars visible from the shore at Carnelian Bay. Their data are nevertheless incomplete, and they are unable to determine the exact night of the event. Then one of the astronomers utters the following:

(204) I wish I had been at Carnelian Bay that night

Arguably, the astronomer's wish is not about any particular night, and this is incompatible with the idea that "that night" is opaque to modal quantification: it should pick out a different night in each of the circumstances compatible with the astronomer's wish. Thus, it contradicts my prediction that complex demonstratives containing no relative clause cannot be affected by verbal quantifiers. King's solution is, of course, to treat "that night" as a quantified expression meaning roughly the same as "the unique night in which the shooting stars were visible", where the property of *being a night in which the shooting stars were visible* is supplied by the referential intentions of the speaker in the context.

I do not think this is a clear counterexample to my theory. In this situation, as in most of the cases of non-redundant NDNS-uses discussed by King (2001: 66-74), the problematic complex demonstratives seem analyzable as E-type. It is not hard to see that the astronomer in the above example could not have employed the demonstrative the way he did unless there was some anaphoric antecedent available and easily retrievable from the previous conversation. This analysis can be applied to virtually every non-redundant NDNS-reading discussed by King. These data lead to another conclusion: Fregeanism is permissible in complex demonstratives without a relative clause iff they can be given an E-type reading.

This is, in fact, a feature they share with pronouns in general, for E-type personal pronouns can also be affected by modal operators.

In sum: the discussion in this section suggests that c-theories can allow there to be cases in which complex demonstratives are affected by modal operators, and treat them as a particular case of QI. Of course, this is just revelatory of one of the main features of the system we are employing: in the current framework, modal and temporal quantification are monstrous operations. Informally speaking, embedding a sentence under a verbal quantifier binding world and time variables is equivalent to making it fall under the scope of a monster that shifts the value of "actually" and "now".[112] The system could nevertheless be made compatible with the idea that verbal quantifiers are not monsters: all that is required is to make time and world variables depend on a different assignment function, one that is located in the circumstances of evaluation rather than the context. Then binding world and time variables would not count as a monstrous operation. I leave this idea for future work.

On the other hand, this discussion should also make it clear that this system requires redefining Millianism and direct reference, since it does not fit the definitions provided in section 3.3.2.2. Georgi, for example, regarded a term *e* as Millian iff every occurrence of *e* not under the scope of a quantifier is directly referential. Intensional operators are modelled in this system as quantifiers over times and worlds, and we don't want Millian terms to be affected by verbs like "believe"; a better definition for this notion is one in which a term *e* is Millian iff every occurrence of *e* not within the scope of a quantifier binding worlds or times is directly referential. Similar modifications should be implemented in Salmon's definition of "direct reference". This means that, excluding E-type readings, complex demonstratives containing no tensed verb, like the one in (11), are Millian and directly referential, whereas those like the one in (84a), which make explicit reference to time and worlds, are not. In light of the examples so far discussed, this is as it should be. But, as I stated above, I will not argue about the labels.

[112] Von Stechow originally presented his system as a response to Schlenker's (2003), which makes extensive use of quantification over contexts in order to model several phenomena about indexical shift. Von Stechow vindicated Kaplan's prohibition on context-shifting on the basis that the same predictions could be achieved by means of a system employing only variable binding, but the discussion in 3.3.2.1 should have made it clear that this response is ineffective: even if the context never shifts, von Stechow's system allows monstrous operations on the character of indexicals by means of manipulating the assignment function.

The suggested pattern should already be clear: non-deictic uses of complex demonstratives are licensed only if they are under the scope of a monster or subject to E-type interpretation. This is essentially what is going on in all the counterexamples against directly referential accounts presented in 2.2.1.2, and this also includes the evidence from attitude reports. When neither of these mechanisms is available, the complex demonstrative functions just like any other well-behaved indexical; the canonical deictic uses discussed throughout section 2.1 illustrate this idea. Of course, this pattern is not exclusive to complex demonstratives: it is followed by virtually any indexical. It is for this reason that the central idea of c-theories appears to be the right one: complex demonstratives are, just like "I", "you" or "she", context-dependent singular terms with a variable character. In the next section I analyze some crosslinguistic evidence that, at least *prima facie*, seems to render further support to this analysis.

3.3.5.3 Crosslinguistic evidence for 3.3.5.2

Let me now digress a bit and discuss an important source of evidence in favor of analyzing NDNS-uses in the terms discussed above. Although the analysis I shall carry out here is very preliminary and far from conclusive, I will tentatively suggest that the use of subjunctive mood in modern Romance languages renders further support to the idea that the non-deictic nature of some complex demonstratives is due to the presence of a verb. Since we still lack a serious account of the functioning of subjunctive,[113] I shall present the discussion in informal terms. Notice, too, that I don't intend the following analysis to be conclusive nor exhaustive; all I wish is to show that it provides compelling reasons for thinking that the analysis developed here is on the right track.

Subjunctive mood in modern Spanish, French, Italian or Catalan is employed roughly in the same way as it was in medieval English, when its usage was much more widespread than nowadays. Here is an example of a previously grammatical use of subjunctive in English:

[113] The analyses of subjunctive from the point of view of formal semantics are scarce. See, e.g., Quer (2001) and Schlenker (2005).

(205) I will not let thee go, except thou ***bless*** (as opposed to "blessest") me (King James Bible, Genesis 32: 26).

Modern English still retains some remnants of these archaic uses: "come what may", "God save the Queen". Its presence is nowadays far less widespread, and it indicates that a situation is uncertain, hypothetical, possible or even unreal. An interesting fact about modern English is that subjunctive can only appear under the scope of verbal quantifiers, in positions in which it is often interchangeable with its indicative counterpart:

(206) Mary suggested that Greg *be* appointed head of department

(207) It is important that Mary *stay* during the whole meeting

Subjunctive in Romance languages works just like in these examples. The pattern they display is similar to that of English, although subjunctive is far more common, and it is in fact compulsory in certain constructions. For instance, the Spanish counterparts of (206)-(207) require, rather than just allow, the use of subjunctive. And expressions that paradigmatically quantify over worlds, like "it is necessary" and "it is possible", require subjunctive too. Take the following examples from French (I am glossing the translation of subjunctive into English as if it were the infinitive):

(208) Il faut que la communauté ***comprenne*** les risques que ces dangers représentent

"It is necessary that the community ***understand*** the risks that these hazards pose"

(209) Il est possible que votre nom d'utilisateur ***ait*** déjà été choisi par une autre personne

"It is possible that your username ***have*** already been chosen by another person"

Interestingly, verbs like "want" or "doubt" also require subjunctive in Romance languages. Here is an example from Italian:

(210) Voglio che ***sia*** chiaro che dubito che questo ***sia*** conforme alla costituzione

"I want that (it) ***be*** clear that I doubt that this ***be*** in accordance with the constitution"

(I want to make it clear that I doubt that this is in accordance with the constitution)

An interesting fact about verbs in Romance is that the world variables marked with the indicative seem opaque to binding by modal verbs when they appear within relative clauses. Consider the following contrast in Spanish:

(211a) Debemos encontrar un secretario capaz de hablar árabe

"We must find a secretary able to speak Arabic"

(211b) Debemos encontrar un secretario que habla árabe

"We must find a secretary that speaks-IND Arabic"

(211c) Debemos encontrar un secretario que ***hable*** árabe

"We must find a secretary that ***speak***-SUB Arabic"

Sentence (211a) displays the usual scope ambiguities: it may mean either that we must find a particular secretary who happens to be able to speak Arabic, in case the quantifier takes wide scope, or that we must find any secretary whatsoever as long as she speaks Arabic, in case it takes narrow scope. However, (211b) differs from its English translation in an important respect: it is not ambiguous, for it only displays the *de re* reading. Something similar occurs in (211c), where only the narrow scope reading is available. If "must", *qua* verbal quantifier, were able to bind the variable contributed by the indicative "speaks", we should expect (211b) to display the narrow scope reading, but it does not. On the other hand, the fact that (211c) does not display ambiguities indicates that its world variable must always be bound.

Let us now go for the main point: unlike English, complex demonstratives in Romance languages can also contain verbs in subjunctive mood. For example, a sentence like (84) has two possible translations into Catalan, one with the indicative and another one with the subjunctive:

(212a) Aquell estudiant que **ha** tret un cent a l'examen és un geni

"That student who **has-**IND scored one hundred on the exam is a genius"

(212b) Aquell estudiant que **haja** tret un cent a l'examen és un geni[114]

"That student who **have**-SUBJ scored one hundred on the exam is a genius"

But, importantly, these two readings are not equivalent: (212b) can only be employed for expressing a purely general thought, whereas (212a) is inappropriate unless the speaker has a particular individual in mind. For example, a use of (212b) by Greg in SITUATION A would sound far more felicitous than an utterance of (212a). Similarly, (212a) is usually more appropriate in scenarios we would associate with direct reference. Consider the following setting:

> SITUATION E: Amy and Laura are discussing the results of the exam. Mary is Laura's student, and they know each other pretty well, but for some reason Laura is unable to remember Mary's name. Amy asks Laura her opinion, in general terms, about her own students, and Laura, who still cannot recall Mary's name, responds thus:
>
> (213) Well, none of them are particularly brilliant. However, *that student who scored one hundred on the exam is a genius*

When translating the underlined material into Catalan, Spanish or other Romance languages, (212b) would be a rather inappropriate choice, but (212a) sounds perfectly fine. In this example, which illustrates a canonically directly referential use of a demonstrative, the use of indicative is almost compulsory. Interestingly, these facts are reproduced if we embed (84f-g) under an attitude verb. Here are some further examples from Catalan:

(214a) Greg creu que aquell estudiant que ***ha*** tret un cent a l'examen és un geni

"Greg believes that that student who ***has***-IND scored one hundred on the exam is a genius"

(214b) Greg creu que aquell estudiant que ***haja*** tret un cent a l'examen és un geni

"Greg believes that that student who ***have***-SUB scored one hundred on the exam is a genius"

[114] The subjunctive verb "haja" in this example is displaying the typical morphology of third-person subjunctive in the València area, namely the morpheme *–a*. Other Catalan-speaking territories use *–i* instead, thus resulting in "hagi".

The complex demonstrative in (214b), containing subjunctive, works pretty much as if it were a narrow scope definite description and, in fact, its truth does not even require that there be any student who actually scored one hundred; the one in (214a), on the contrary, is canonically employed with a particular individual in mind, pretty much like a proper name or a personal pronoun. This means that (214a-b) are roughly equivalent to (84f) and (84h), respectively:

(84f) $<w_0^{ind}, t_1^{pres}>$ Greg believes $\lambda<w_2, t_3>$. $<w_2, t_3>$ that student who$_4$ [$\exists t_6$: $t_6 < t_5^{pres}$] ($<w_7^{ind}, t_6 >$ R_4 score one hundred on the exam) is a genius

(84h) $<w_0^{ind}, t_1^{pres}>$ Greg believes $\lambda<w_2, t_3>$. $<w_2, t_3>$ that student who$_4$ [$\exists t_6$: $t_6 < t_3$] ($<w_2, t_6 >$ R_4 score one hundred on the exam) is a genius

In other words, (214a-b) can be taken to express, respectively, the two propositions that as we argued in the previous section, (84a) is able to express, namely (84g) and (84i):

(84g) λc: in all circumstances *i* compatible with what Greg believes in i_c, $\underline{\delta_c (\lambda x. \lambda j.}$ $\underline{\text{there is a time t occurring before } t_c \text{ such that x is a student in } <w_c, t> \text{ and x scored}}$ $\underline{\text{one hundred on the exam in } <w_c, t>)}$ is a genius in *i*

(84i) λc: in all circumstances *i* compatible with what Greg believes in i_c, $\underline{\delta_c (\lambda x. \lambda j.}$ $\underline{\text{there is a time t occurring before } t_i \text{ such that x is a student in } <w_i, t> \text{ and x scored}}$ $\underline{\text{one hundred on the exam in } <w_i, t>)}$ is a genius in *i*

Or, to put it differently, Catalan, Spanish and other Romance languages mark an explicit distinction between the two possible readings, *de re* and *de dicto*, of (84a). Analogous remarks hold for other NDNS-uses like (85) and (88b).[115] The very fact that (84a) can be

[115] Just like in the case of (84a), there are two different ways to translate (85) and (88b) into Spanish:

(85*) Ese homínido que ***descubrió*** cómo encender fuego era un genio
"That hominid who ***discovered***-IND how to start fire was a genius"

(85**) Ese homínido que ***descubriera*** cómo encender fuego era un genio
"That hominid who ***discovered***-SUB how to start fire was a genius"

(88b*) Toda chica está buscando a ese chico que ***hace*** que su corazón palpite más deprisa, su estómago aletee y su mente dé vueltas
"Every girl is looking for that boy who ***makes***-IND her heart beat faster, her stomach flutter and her mind wander"

translated in two different, non-equivalent ways into other languages constitutes evidence that, even in English, it should be considered ambiguous between two distinct readings. This ambiguity can, of course, be resolved at the level of LF; this is what my system attains by distinguishing between (84f) and (84h). Of course, this analysis is not available for sentences like (88c), which can only be given one reading – an accurate prediction.

What are the implications of this? Although the semantics of subjunctive is far from well-established, one thing that is clear about it is that *it requires quantification over possible worlds*. English itself is an example, for sentences like (206) and (207), and in fact (89) too, show that subjunctive mood can only appear in combination with world variable binders. This means that the complex demonstrative in (214b) contains a bound world variable. But, importantly, the world variable in (214a), marked with an indicative feature, does not have a bound reading, for "believe" is unable to bind it, as the facts in (211a-c) demonstrate.

This is all still very speculative, but *prima facie* it supports my analysis above: if a non-deictic use of a complex demonstrative in Romance languages requires that the demonstrative contain subjunctive, as in (214b), and therefore that its world variable be externally bound, we have a good reason to think that its non-deictic nature is due to quantification into the character of the demonstrative. Whenever the world variable cannot be bound (i.e., when it is in the indicative mood, as in (214a)), the complex demonstrative necessarily selects an individual. English cannot resort to subjunctive in order to dissipate the ambiguity in sentences like (84), (84a), (85) and (88), but it can achieve similar results by means of binding: each of the two possible readings of these sentences, *de re* and *de dicto*, can be achieved, respectively, by leaving the world variable within the demonstrative free or by letting the attitude verb bind it. In other words, it is very plausible to assume that (214a-b) are, just as we mentioned above, the two disambiguated versions of (84a), i.e., (84f) and (84h), respectively. Generalizing on these cases, we can assume that, whenever the world variable is free, as in (84f) or (214a), the complex demonstrative can only display a referential

---

(88b**) Toda chica está buscando a ese chico que ***haga*** que su corazón palpite más deprisa, su estómago aletee y su mente dé vueltas
"Every girl is looking for that boy who ***make***-SUB her heart beat faster, her stomach flutter and her mind wander"

And, as in the above cases, there is a huge difference between the two translations: (85*) and (88b*) can only be read *de re*, whereas (85**) and (88b**), on the contrary, are appropriate just in case the speaker has no particular individual in mind.

reading – leaving E-type anaphoric cases aside, of course. In other words, non-deictic uses of complex demonstratives only arise when they are subject to QI or, more generally, some monstrous operation on character.

3.4 Why treating them as singular terms works better

If the preceding discussion is right, then c-theories are not just able to accommodate all the problematic counterevidence that has been raised against them: they also provide the most parsimonious model of the semantics of complex demonstratives. The two mechanisms postulated in order to account for non-deictic uses of these expressions, namely monsters and E-type anaphora, are independently motivated, and they are not exclusive for complex demonstratives, for they affect the behavior of *any* indexical. C-theories also predict that, whenever these mechanisms are not available, complex demonstratives will behave pretty much like "he", "she" or "I", i.e., as a context-dependent singular term. This is essentially what is going on in the deictic uses of complex demonstratives by means of which we illustrated the main tenets of directly referential theories (section 2.1)

Critics of direct reference paradigmatically endorse quantificational views of complex demonstratives. This kind of approaches often overgenerate, for they predict many readings complex demonstratives do not actually display; solving this problem usually requires appealing to extra-semantic issues, such as the nature and composition of the possible contexts of utterance (cf. King 2001). A more important reason for rejecting quantificational theories is that, unless we are willing to give up the whole current paradigm of indexicality, they are unmotivated: any reasons we may have for thinking that complex demonstratives are quantificational should lead us to regard "he" or "she" as quantifiers too.

On my view, these facts should suffice for endorsing the traditional view of complex demonstratives, but, just in case you are still unconvinced, in this section I briefly present an important advantage of understanding complex demonstratives as singular terms: it provides the simplest way to deal with the evidence from anaphora and ellipsis. These data, I shall argue, cannot be accommodated by most quantificational views, and therefore fatally

undermine these approaches. Finally, I also discuss some arguments that have been put forward in order to cast doubts on the evidence usually employed by c-theorists.

3.4.1 Singular terms, anaphora and ellipsis

Recall the following contrast, first noticed by James Higginbotham (1988):

(12a) Laura hates the man sitting by her side, but Julia loves him

(12b) Laura hates that man sitting by her side, but Julia loves him

(13a) Laura hates the man sitting by her side, and Julia does too

(13b) Laura hates that man sitting by her side, and Julia does too

As stated in the introduction of section 2.1, sentences (12a) and (13a) are ambiguous between a strict and a sloppy reading: (12a) can mean either that Julia loves the man sitting by Laura's side or the man sitting by her own, and (13a) can attribute to both Julia and Laura hatred towards the same man or towards a different one for each of them. This is in stark contrast with (12b) and (13b), which only display the strict reading. Other quantifiers display the same pattern as definite descriptions; the following sentences are equally ambiguous:

(215) Laura hates a man sitting by her side, but Julia loves him

(216) Laura hates most men she knows, and Julia does too

VP-ellipsis, as it occurs in these examples, is resolved by attributing to the subject of the second sentence the same property predicated from the subject of the first one. The different readings that can be obtained for the second sentence are, in turn, due to the possibility of reading the first one in different ways. Let me put this in semi-formal terms. The first sentence in (13a) can be taken to express one of the two following propositions:

(217a) <Laura, λx. x hates [the y: y is a man and y sits by Laura's side]>

(217b) <Laura, λx. x hates [the y: y is a man and y sits by x's side]>

Attributing each of these properties to Julia yields the two possible readings:

(218a) <Julia, λx. x hates [the y: y is a man and y sits by Laura's side]>

(218b) <Julia, λx. x hates [the y: y is a man and y sits by x's side]>

But, importantly, the descriptive meaning of the demonstrative in (13b) does not enter into the proposition expressed by it. Given a context *c*, it will express the proposition that Laura hates a certain object, namely δ_c (λx. λi. x is sitting by Laura's side in i). If δ_c (λx. λi. y is sitting by Laura's side in i) = John, then (13b) expresses the following proposition:

(219a) <Laura, hating John>

And attributing to Julia the same property Laura is attributed can only yield one possible result:

(219b) <Julia, hating John>

Notice, in fact, that these facts are analogous in the case of pronouns in general. Let $g_c(1)$ = John. Then the proposition expressed by (220) below in *c* is, simply, (219a):

(220) Laura hates him_1

And, of course, (219a) is the *only* reading (220) can be given; this means that it is not ambiguous, which in turn entails that it is unable to give rise to different readings when it is read in combination with elliptical sentences. For example, (220a) can only be given a strict reading:

(220a) Laura hates him_1, and so does Julia

Ellipsis is a complex matter, but these data should in principle support the idea that complex demonstratives are better understood on the model of pronouns.[116] The mechanism

[116] Notice, in fact, that this is not the end of the story, for it could be argued that my account predicts that (13b) is also ambiguous between two readings:

(13') <Laura, λx. x hates δ_c(λy. y is sitting by Laura's side)>

(13'') <Laura, λx. x hates δ_c(λy. y is sitting by x's side)>

And this means that a sloppy resolution should be allowed. A response to this criticism could take a whole paper, but I believe the answer to this question lies in the idea that it is not possible to devise an LF for (13b) in which a lambda binds the pronoun internal to the demonstrative. I.e., this LF, in which the complex demonstrative is quantified into, is not permissible:

(13*) [Laura] λ1. r_1 hates that man sitting by her_1 side

The reason for not allowing something like this is that it would require "Laura" to raise (recall that, in Heim & Kratzer (1998), the only way to bind a variable is by means of QR), and this requires this proper name to be treated as a quantifier. This is something that is usually done, and some theorists, most notably Montague (1970, 1974) even suggested that proper names should always be given the type of quantifiers.

This idea, however, was found to be empirically inadequate. Partee (1987) and Partee & Rooth (1983) argued that it was better to assign to expressions a default type and to allow them to undergo type-shifting in certain environments, namely those in which the sentence is uninterpretable unless some type-shift occurs. (13b) is perfectly interpretable as it stands, and this means that "Laura", as it occurs in this sentence, is still of type *e*

for solving anaphora should be analogous in both cases. Of course, all this evidence is rather hard to explain for quantificational theories in general, for they predict that sentences containing complex demonstratives should be subject to sloppy readings as much as (12a), (13a), (215) or (216) are – Lepore and Ludwig (2000) are probably the only exception. On the other hand, none of this should pose any problem for directly referential approaches, be it c-theories or mp-theories.

3.4.2 Did character theories get things wrong?

The data about anaphora and ellipsis strongly support the idea that complex demonstratives should be understood on the model of pronouns. This kind of evidence, along with the facts about entailment, opacity and attitude reports are often perceived as the best case for directly referential theories. Some authors have nevertheless cast some doubts about the conclusiveness of these data: perhaps anaphora, entailment and the like are not so supportive of c-theories after all. This final section is devoted to examining, and ultimately rejecting, some ideas that have been put forward against the idea that complex demonstratives behave just like any other indexical when it comes to the aforementioned phenomena. I discuss two main sets of data: a series of arguments that Lepore & Ludwig (2000) and King (2001) have put forward for arguing that narrow scope readings of complex demonstratives are always available, and an argument by Predelli (2001) presenting an apparent disanalogy between complex demonstratives and other indexicals regarding anaphora.

---

and therefore unable to raise. This, in turn, means that it can yield to LF no lambda binding the pronoun "her", thus preventing the sloppy reading from occurring.

Of course, this means that the proper name in (13a) should be allowed to raise. On my view, this occurs because (13a), unlike (13b), contains a quantifier in object position, and is therefore uninterpretable unless it undergoes QR. Once QR has been allowed, it should be permissible for the proper name to raise too. This idea predicts two possible LF's for (13a):

(13**) [The man sitting by her$_1$ side] λ2. Laura hates r_2

(13***) [Laura] λ1. [The man sitting by her$_1$ side] λ2. r_1 hates r_2

The two readings predicted, (217a-b), derive respectively from (13**) and (13***). The story is surely longer, but I need not go into a whole theory of ellipses here; it is enough with acknowledging that the facts about anaphora and ellipsis favor an understanding of complex demonstratives on the model of pronouns.

3.4.2.1 Opacity: attitude reports and modal operators

My account predicts that the descriptive meaning of complex demonstratives is sometimes transparent to modal quantification, but this concession to Fregeanism constitutes the exception rather than the rule: it can only arise in case a complex demonstrative containing a tensed verb is embedded under a modal quantifier. As mentioned above, this idea correctly predicts the contrast between (88b), which is ambiguous between a *de re* and a *de dicto* reading, and (88c), which can only be read *de re*:

> (88b) Every girl is looking for that boy who makes her heart beat faster, her stomach flutter and her mind wander
>
> (88c) Every girl is looking for that boy

Some authors, however, have argued that the ability of complex demonstratives to be affected by modal operators should be generalized. If this were the case, then the c-theorist would be in trouble, for, on her theory, most complex demonstratives are as opaque to modal quantification as "he" or "she" are. In this section I analyze and refute some of the arguments that have been put in the literature in favor of the thesis that we might dub "*generalized transparency*".

We have already discussed one of the examples adduced in favor of this thesis: King's (2001) sentence (204) in the scenario with the two astronomers. As I mentioned there, it is very plausible to regard this example as a case of discourse anaphora. However, he discusses further cases that *prima facie* seem to favor generalized transparency. Consider the following scenario he presents: Deena and Alan are discussing whether a certain stone, *b*, is a diamond, and Alan, in order to solve the dispute, asks his geologist friend Ed about the rock. Ed does not believe it is a diamond, yet he does think that that stone might be valuable anyway. Suppose further that Ed is in fact mistaken and the rock in question is actually a diamond. Alan, still convinced that the rock is a diamond, reports Ed's statement to Deena as follows:

> (221) Ed said that diamond is very valuable

It is clear that Alan is not being sincere to Deena, a fact that would be straightforwardly explained in case "diamond" were to be assessed not in the context of utterance but rather

according to the circumstances compatible with what Ed said. If this were the case, Alan's utterance of (221) would straightforwardly qualify as false. This is taken by King as evidence in favor of his account, which is able to count the descriptive meaning "being a diamond" as circumstance-dependent.

This explanation sounds to me unconvincing. While Alan's insincerity is out of question, I am not so sure about the idea that he has *lied* in uttering (221), as opposed to having merely *misled*. This is an important distinction and has given rise to a large amount of literature;[117] roughly, it is usually accepted that lying requires that the speaker believes the literally asserted content to be false[118] (Williams 2002), whereas misleading is a broader notion that allows the deceptive content to be implicitly communicated – say, at the level of implicature or presupposition. Directly referential accounts can concede that Alan is insincere without thereby acknowledging that he believes the literal content of his utterance to be false. On the account sketched here, (221) expresses the following proposition,

> (221a) λi. For all circumstances j compatible with what Ed said in i, *b* is very valuable in j,

where *b* is of course required to have been picked out by the function δ as the argument of "being a diamond" in the relevant context. Obviously, Alan knows that this proposition is true in the above context, in which Ed said of *b* that it is valuable. But the descriptive content of the demonstrative plays a role very similar to that of a presupposition, i.e., Alan is conveying his own belief that the rock is a diamond. And, given the fact that they are taking Ed to be an authoritative source about the properties of *b*, Alan might as well be implicating that the reason why he believes that *b* is a diamond is because Ed said so – after all, Alan is following Ed's criterion. Arguably, many other alternative explanations could be construed.

Notice, in fact, that it is possible to devise parallel examples containing only proper names. Consider the following scenario: Flash Thomson, who despises Peter Parker but deeply admires his superheroic alter ego Spider-Man, utters (222):

---

[117] See Carson (2006), Saul (2012) and Stokke (2013) for overviews.

[118] It is a different question whether the content should also be false, in addition to being held false by the liar. Grimaltos & Rosell (2013) advocate for what they call the "*falsity condition*", which is also tentatively endorsed by Carson (2006). Williams (2002) rejects it. See some discussion on the consequences of the falsity condition in Grimaltos & Rosell (2017: 11-12).

(222) Spider-Man surely is a nice person

Gwen overhears Flash's utterance and then reports it to her friends:

(223) Flash said Peter must be a nice person

Just as in the above example, it is unclear whether we should say that Gwen is lying or merely misleading. Assuming a Millian view of proper names, it is clear that, content-wise, she said something true: in all the circumstances compatible with what Flash said, Peter Parker is a nice person. This is perfectly compatible with acknowledging some kind of deceptive intention on Gwen's part, taking place at a non-literal level. This example is entirely analogous to Alan's, and therefore I do not think we should take the latter as conclusive regarding the alleged possibility that "that diamond" may be affected by modal operators.

Another source of alleged transparency comes from the interaction of complex demonstratives with necessity and possibility operators. Richard (1993) presents the following sentence as a possible counterexample to his own theory:

(224) Necessarily, if that dog with a blue collar exists, then it has a collar

This sentence expresses a false proposition. But, given Richard's endorsement of an approach in which complex demonstratives contribute their descriptive meaning to the proposition expressed, he predicts that "dog with the blue collar" should be transparent to modal quantification, and that this sentence is therefore ambiguous between two readings, one of which is straightforwardly true:

(224a) □ (if α exists and α is a dog that wears a blue collar, then α wears a collar)

(take α to be the demonstrated animal). At least *prima facie*, (224) does not have a true reading, and therefore Richard's prediction that it can be read as (224a) constitutes a counterexample to his theory. He responded to his own objection by claiming that what was going on in this sentence was something special having to do with presence of "exists", although he remained not entirely convinced by his own response. Lepore and Ludwig (2000), on the contrary, disputed the very claim that (224) cannot have a true reading: although standardly read as false, they argued that it can also be given a reading roughly

corresponding to (224a), one that is in fact predicted by their theory. On their view, this sentence should be ambiguous between (224b-c), and the latter corresponds to the narrow scope reading, i.e., a reading in which the sentence is true:

(224b) [the *x*: *x* = α & *x* is a dog with a blue collar] (*x* exists → □ α wears a collar)

(224c) □ [the *x*: *x* = α & *x* is a dog with a blue collar] (*x* exists → α wears a collar)

All I can say against Lepore and Ludwig's claim that (224) has a true reading is that I am completely unable to hear this sentence as equivalent to (224a) or (224c). And I am not the only one: Braun (1994) denies that this kind of sentences have any true reading, and Richard himself acknowledges that "sophisticated informants [including himself] tend not to hear any reading of this on which it is true" (1993: 220). Of course, this may be due to some sort of philosophical bias; after all, the unnaturalness of the example, along with the fact that "necessarily" could be interpreted epistemically instead of metaphysically, may have contributed to obscure the discussion. As I see it, the dispute can be settled by appealing to a more naturally formulated example. Consider, again, (9):

(9) That bald man could have had hair

As stated above, it seems uncontroversial that this sentence has no contradictory reading. Given that "could" is roughly the natural language equivalent of the possibility operator, I take this sentence to constitute a compelling argument against the idea that (224) can have the extra reading predicted by Ludwig and Lepore's theory. These data, along with the above discussion regarding King's example, should be enough for concluding that complex demonstratives are not generally transparent.

3.4.2.2 Anaphora and the Overt Antecedent Constraint

As the discussion in 3.4.1 should have made clear, anaphora is one of the main strengths of directly referential theories and, more generally, of any theory that treats complex demonstratives as if they were another kind of pronoun. However, Predelli (2001) pointed out that there is an important disanalogy between complex demonstratives and other indexicals when it comes to anaphoric relations: generally speaking, the descriptive meaning encoded in the character of indexicals is not available for anaphoric reference, but the

nominal of a complex demonstrative, on the contrary, can easily serve as antecedent for anaphora. This seems to be in conflict with one of the main tenets of c-theories, namely the idea that the nominal of a complex demonstrative contributes to the character of the expression. The data provided by Predelli are rather conclusive, but I believe it is possible to provide an alternative explanation. Let us first see in more detail what the problem is.

Syntactically speaking, complex demonstratives are not different from other determiner phrases, and it should therefore be no surprise that their subcomponents are available as anaphoric antecedents for other elements in the sentence. The components of any determiner phrase can be referred back to by pronouns, and complex demonstratives are not different in this respect:

(225) [Some men that Mary$_1$ knows] admire her$_1$

(226) [That man talking to Mary$_1$] admires her$_1$

But Predelli points out that this should not be possible if the c-theorist is right. The contribution of the nominal "men that Mary knows" to the proposition expressed by (225) is, simply, its customary content, which includes Mary herself among its constituents; it is for this reason that "her" can inherit its content from that of "Mary". But things are different in (226), for, according to c-theories, the nominal "man talking to Mary" does not contribute to the content of the demonstrative, but rather to its character. The content contributed by the demonstrative is, simply, an individual, which obviously cannot have Mary as its constituent; for this reason, "her" should have no way to refer back to her.

Let me put this in structured terms in order to make it clearer. The content contributed by "some men that Mary knows" includes Mary herself as a constituent, but the content expressed by "that man talking to Mary" is, simply, an individual *b*:

(227) <Some, <λx. x is a man & Mary knows x>>

(228) *b*

Since anaphora is mostly a semantic phenomenon, "her" should be taken to inherit its referent from the *content* expressed by its antecedent. But the problem is that, in the case of (226), Mary does not appear anywhere within the previously expressed content.

A possible response that Predelli sketches on behalf of the c-theorist is that perhaps "her" is not actually inheriting its content from "Mary", but rather is functioning like a demonstrative pronoun: Mary is made salient by the very fact of uttering her name, and this renders her easily available for demonstrative reference by means of the pronoun. However, this story is not entirely convincing, for the occurrence of "Mary" in the following example does not raise her to saliency:

(229) "Mary"$_1$ is my favorite name, and that is why I like her$_1$

The anaphora in this sentence is rather infelicitous if available at all, and this suggests that mentioning Mary's name cannot be the whole story. Predelli argues that there is nevertheless yet an alternative way to ensure that Mary is always salient when her name occurs within a complex demonstrative: she is made prominent by means of character itself. Character provides instructions for selecting a referent, which means that, in order to obtain the content of the complex demonstrative in (226), one must take Mary into account: one needs to identify the individual satisfying the property of *talking to Mary*. And this, of course, should suffice for rendering her salient.

Predelli, however, also rejects the latter explanation, and he does it on the basis that character is never available for anaphoric reference. The character of "I" can be paraphrased roughly as "being the agent of the context", and that of "tomorrow" can be given by "being the day after today". The problem, on Predelli's view, is that this descriptive content cannot serve as the antecedent of an anaphora:

(230) # I$_1$ am delighted, because it$_1$ is just the kind of context I discussed in my latest paper

(231) # Tomorrow$_2$ will be a better day, because it$_2$'s been one of the worst days of my life

I.e., the character of "I" renders a certain context salient, pretty much like "that man talking to Mary" raised Mary to saliency, but this context cannot be referred back to by the pronoun. C-theories predict that Mary and the context that "I" makes salient should be on a par, but clearly they are not, for "her" can pick out the former and "it" cannot pick out the latter. This means that anaphoric links on character are not available, and that therefore Mary cannot be raised to prominence in this way.

As I see it, the idea that Mary is made salient by the character of the expression to this context is perfectly acceptable as long as it is paired with some alternative explanation of why reference to the character of indexicals is normally not permissible. Predelli carries out his discussion in purely semantic terms, which is very reasonable given that anaphora is mostly a semantic phenomenon, but it has been known since the work of Paul Postal (1969) that there also exist *morphological* constraints on anaphora. And this is precisely what I am about to argue: anaphoric reference is as admissible on character as it is on content, but, in the case of average indexicals like "I" or "tomorrow", anaphora is blocked because these words do not meet the appropriate morphological requirements. The phenomenon I have in mind was first noted by Postal himself, and it was dubbed "Overt Antecedent Constraint" by Grosz et al. (2014). Consider the contrast between (232a-b):

(232a) ^{OK} Every man who killed [his brother]$_1$ despised him$_1$

(232b) # Every fratricide$_1$ despised him$_1$

The predicate "fratricide" is equivalent to the phrase "man who killed his brother": both contribute the same character and the same content, and this means that the quantifiers "every fratricide" and "every man who killed his brother" should be equivalent. However, "him" can be anaphoric on a subconstituent of the former and not on the latter. Notice that this phenomenon is a very generalized one, and it holds even cross-sententially:

(233a) ^{OK} Max is a child who lost [his parents]$_1$ and he misses them$_1$

(233b) # Max is an orphan$_1$ and he misses them$_1$

There is a general moral we can extract from these examples: in order for anaphora to occur, the antecedent must be morphologically transparent (Ward et al 1991). And the existence of this constraint provides a very natural response to Predelli's challenge. Anaphora on character is always available as much as it is for content, and it is subject to the same kind of constraints. The reason why the anaphoric link in (230)-(231) is not admissible is, simply, because the indexicals serving as antecedent fail to meet this constraint: the morphological shape of "I" and "tomorrow" does not suggest that they may be related to contexts or days. "Mary", on the other hand, is a perfectly transparent antecedent for "her" to refer back to in (226).

If these arguments are sound, then there should be no obstacle to treat the nominal of complex demonstratives on a par with the descriptive meaning of other indexicals, pretty much as I have been suggesting throughout this whole dissertation. This means that the main tenet of c-theories can be vindicated: the descriptive meaning of a complex demonstrative is part of its character, not its content – nor is it semantically inert. I hope to have been able to convince the reader that this idea, paired with the existence of Kaplanian monsters and some additional independently motivated adjustments, provides the most parsimonious model of the behavior of these expressions. It is now time to stop the discussion and summarize the findings.

4 Conclusions

The theory of indexicality developed by Kaplan (1977, 1989) provided an elegant model of context-dependence in natural language. On this traditional picture, sentences are endowed with a *character* or linguistic meaning; when assessed against a certain context, this meaning is able to return a truth-evaluable *content*. The latter, in turn, is supposed to play many roles within linguistic theory. Content is the argument of intensional verbs and the object that has to be taken into account when resolving ellipses, anaphoras and co-predicative sentences; arguably, it is also relevant for determining whether a certain utterance counts as a lie, a metaphor or a hyperbole (cf. Borg 2019). Perhaps more relevantly for the purposes of this dissertation, it is also supposed to be the level of meaning at which compositional operations apply. This is the whole idea behind Kaplan's prohibition of monsters: every operation in natural language can be defined as a function of content.

When considering the particular case of complex demonstratives, the traditional model of indexicality seems to run into trouble. Although their behavior in intensional contexts, anaphora and ellipsis (section 2.1) strongly suggests that their content in a context should be as simple as an object, it is also true that, on many occasions, their descriptive meaning does seem to enter into what is said by the sentences in which they are contained. QI-uses are probably the most important source of evidence against the directly referential picture: if it is possible to operate on the descriptive meaning of a demonstrative, and if content is supposed to be compositional, then it seems we have good reasons for supposing that the nominal should be part of the truth-conditional contribution of a complex demonstrative.

This is arguably the idea behind many of the approaches explored in this dissertation. On some views (Neale 1993, King 2001; Roberts 2002, 2003; Elbourne 2008; Nowak 2019a, 2019b), the content of a complex demonstrative is not too different from that of a definite description, and the rigidity displayed by most of their uses is to be explained by different means. To borrow Kripke's (1972: 21, footnote 21) distinction, most complex demonstratives are *de facto* rigid but not *de iure* so, according to the above authors. Other approaches are sort of mixed, for they acknowledge that the assertoric content of complex demonstratives

always includes an object among its constituents, but they nevertheless treat the nominal as just another part of their propositional contribution (Richard 1993, Lepore & Ludwig 2000).

On the view I have advocated in this dissertation, we have no more reasons to abandon the traditional treatment of complex demonstratives than we have for giving up on the classical picture of indexicality. The possibility of shifting the value of an indexical is a generalized phenomenon (section 3.3.2.1) and it affects all kinds of pronouns, from "he" and "she" to "I". Complex demonstratives are of course no exception. The main difference is, of course, that they are syntactically complex, which makes it much easier to operate on their character by quantifying into them. That aside, the idea that the non-deictic uses of complex demonstratives can only occur when their character is being operated on appears to be justified in view of the evidence so far discussed. Recall the following pairs:

(142a) She is happy

(142b) Every girl thinks that she is happy

(179a) Px

(179a) ∃x (Px)

(181a) I did my homework

(181b) Only I did my homework

All these sentences involve expressions whose propositional contribution varies from occurrence to occurrence. Variables and pronouns can be safely seen as contributing an object to the proposition expressed by (142a), (179a) and (181a), but it should be clear that, when they are under the scope of a monster, their contribution to what is said is shifted, as in (142b), (179b) and (181b). The shiftiness of complex demonstratives is an instance of this more general phenomenon. For the most part their functioning is pretty much like that of any well-behaved indexical, but sometimes they may occur under the scope of a monster, which prevents them from contributing their customary content. The only thing that is special about complex demonstratives is that, in addition to the usual bound readings (section 3.3.3), they can also be shifted through an additional mechanism, namely QI. For example, (234a) below may be taken to express a singular proposition in a random context *c*; if $\delta_c([\![\text{cleric who crowned her}_1]\!])$ = William Howley, then it expresses the proposition in (235a). The complex

demonstrative in (234b), on the other hand, is under the scope of a monster, and this means that its contribution to what is said is shifted. As a consequence, the proposition it expresses, namely (235b), is not singular:

(234a) That cleric who crowned her$_1$ is a nice person

(234b) [Every queen] λ1. believes that that cleric who crowned her$_1$ is a nice person

(235a) <Howley, being a nice person>

(235b) ∀x (x is a queen → x believes that δ_c(λy. λi. y crowned x in i) is a nice person)

It is for this reason that c-theories (section 2.1.2), which treat complex demonstratives on a par with pronouns, can be plausibly assumed to be the most parsimonious model of the functioning of these expressions. On the one hand, they treat them as singular terms whose usual contribution to the proposition expressed is simply an object, and this explains all the data about opacity, ellipsis and anaphora. On the other hand, the idea that the nominal contributes to the character of the term accounts for the inferential pattern noted in (28)-(29) and, additionally, for the idea that complex demonstratives in hyperintensional contexts will always display non-deictic readings. And, insofar as tense and mood are treated on a par with pronouns (section 3.3.1.2), the very same solution can be applied to NDNS-readings too (section 3.3.5). Other approaches treating complex demonstratives pretty much like any other indexical, such as mp-theories (section 2.1.3), could also be adapted for yielding similar results.

Of course, the solution advocated in this dissertation entails giving up an important role of content: it can no longer be regarded as the level of meaning at which compositional operations apply. This might be seen as an undesirable consequence, but recall from the discussion in 3.3.2.1 that it is something we needed anyway if we wanted to preserve the idea that sentences containing non-bound indexicals express singular propositions. And, on the other hand, lifting Kaplan's ban also means granting character the role that pertains to the linguistic meaning of expressions. Prohibiting monsters somewhat downplayed the role of character: if all semantic operations can be defined as functions of content, then it is unclear why character would even qualify as "meaning". Given that its role within the compositional

semantics of a language is redundant, it might as well be regarded as a set of rules for the correct use of indexical expressions, rather than an actual layer of meaning. This idea seems nevertheless inconsistent with Kaplan's conception of notions like validity and entailment. Validity is often seen as the formal counterpart of analyticity, i.e., *truth in virtue of meaning*, and it is defined by Kaplan as *truth in virtue of character*. If character is to be regarded as a genuine level of meaning, there should be no obstacle in granting it a role within the compositional semantics of a language. This does not mean that content is not an important notion anymore; arguably, it still has very relevant roles to play. All it means is that we must allow a division of labor within semantic theory: purely meaning-related notions such as analyticity and compositionality pertain to character, whereas content, in turn, can be held responsible for anaphora, ellipsis, indirect speech and, more generally, what is asserted. As I see it, we have no reason to expect that a single entity can fulfill all these roles.

There are, of course, further adjustments that c-theories need to implement in order to tackle the problematic counterevidence. E-type anaphora (section 3.3.4) is a problematic phenomenon for theorists of direct reference in general, and it must be dealt with some way or another. Additionally, I also advocated for dropping any requirements to the effect that the object picked out by a demonstrative should be demonstrated (section 3.1), and the lexical entry I ultimately devised disposed of the very notion of a *demonstratum* (section 3.2). A further requirement was the adoption of a system with object-language quantification over worlds and times (section 3.3.1.2). The latter two adjustments, together with the lift of the monster prohibition, point towards a certain metaphysical picture of the notion of context that I would like to say a word about. Namely, I believe that context should be conceived pretty much like the later Kaplan (1989) did: a tuple consisting of all the parameters required for the determination of content, regardless of how these parameters may be obtained.

Contexts are often conceived as formal representations of real speech situations. The parameters contained in a context are supposed to be retrievable from the real setting it purports to represent, but it should be clear that this relationship is not as straightforward as it might *prima facie* appear to be. Appeal to demonstrations, for example, will be of no help: in order to interpret a sentence like (77), for example, we need the context (and more concretely the δ function) to be able to determine, for each individual x and circumstance i, an object satisfying the property of crowning x in i – provided that x is a queen in that

circumstance. It is implausible to assume that a speaker could be demonstrating all these objects at once, and it is therefore unlikely that these parameters can be settled by objectively determinable features of the relevant speech situation – say, pointings or any kind of ostensive gestures. The very same thing could be said about the idea that context should determine the value of an infinite number of variables for times and worlds, and things could get even more dramatic if we assumed that tenses are referential.

Intentions or conventions are arguably more plausible candidates for determining what kind of formal context best represents a certain situation, but at any rate it is unlikely that these conditions should be lexicalized into the meaning of indexicals. Context should therefore be seen as a formal representation of whatever parameters are required by the sentence for initializing content, but the right way to relate these parameters with actual speech situations is a matter of pragmatics. They are not more objective than assignment functions have traditionally been thought to be. This idea, paired with the idea that virtually every parameter of context can be shifted, suggest that perhaps semantics should do away with the very notion of context and work, simply, with an assignment. Similarly, the distinction between pure indexicals and true demonstratives should be disposed of. After all, the idea that formal contexts are representative of actual settings out of which all the relevant values can be automatically retrieved has been pointed out as a source of confusion regarding the aims and scope of semantic theory (Predelli 2005a).

5 Resum (summary)

Aquesta tesi té com a objectiu tractar la semàntica dels demostratius complexos, ço és, expressions amb la forma "aquest home", "eixa cadira" o "aquella dona". Les expressions d'aquesta mena són el resultat de combinar un demostratiu amb un sintagma nominal i, malgrat llur complexitat sintàctica, han estat tradicionalment considerades com a termes singulars, i més concretament com a instruments de referència directa. Així, per exemple, un enunciat com ara (236a) expressaria una proposició singular com la que podem representar, en termes estructurats, a (236b):

(236a) Aquell home amb barret és calb

(236b) <α, ésser calb> (on α és el referent del demostratiu)

La teoria de la dixi desenvolupada per David Kaplan (1977, 1978, 1989) va assentar les bases per a aquest model tradicional del funcionament dels demostratius complexos. En la teoria clàssica, els díctics són directament referencials: expressions com ara "jo", "tu", "demà" o "ella" disposen d'un significat descriptiu anomenat *caràcter* que ajuda a fixar-ne el referent en un context però que ja no juga cap més rol un cop aquest individu ha estat determinat. Saber qui és el parlant, l'oïdor, la sendemà del dia d'emissió o la dona assenyalada pot servir per determinar quin objecte ha estat contextualment seleccionat per les expressions que acabem d'esmentar, però aquesta mena de significat descriptiu no entra dins les condicions de veritat de la proposició expressada, i això vol dir que l'única contribució que els díctics fan al contingut proposicional és un individu. Aquesta mena de teories van ser adaptades per al cas concret dels demostratius complexos per autors com ara David Braun (1994), Emma Borg (2000) o Nathan Salmon (2002). La idea central d'aquestes propostes és que els demostratius complexos són semànticament anàlegs a qualsevol altre pronom díctic: el seu significat descriptiu, donat per la part nominal, contribuïx al caràcter de l'expressió però no té efectes sobre el seu contingut. És per aquesta raó que se les anomena "teories del caràcter" o "teories-c" (Predelli 2001).

Aquest model tradicional fa diverses prediccions que, almenys d'entrada, pareixen ben acurades. Per exemple, prediu que els demostratius complexos són opacs als operadors intensionals, i que per tant no són afectats per adverbis modals i temporals ni per verbs

d'actitud proposicional. Considereu el contrast entre enunciats com (237)-(239), que contenen descripcions definides, i (240)-(242), amb demostratius complexos:

(237) El primer home a l'espai podria haver estat americà

(238) L'any vinent el batlle de València visitarà Castelló

(239) Alba creu que l'assassí de Smith és innocent

(240) Aquesta cadira de tres potes podria haver-ne tingut quatre

(241) Demà eixe xiquet serà adult

(242) Dídac creu que aquell home barbut va afaitat

Els enunciats amb descripcions definides són ambigus entre una lectura *de re* i una altra *de dicto*. Llegides *de re*, (237) i (238) són vertaderes, respectivament, si hi ha la possibilitat que Yuri Gararin siga americà i si Joan Ribó visita Castelló l'any vinent, independentment de les fites espacials del primer en la possibilitat alternativa que estem considerant i del càrrec que el darrer ocupe durant la seua visita. Si les llegim *de dicto*, en canvi, el que diu (237) és que els americans van avançar els soviètics a la carrera espacial, mentre que (238), per la seua banda, serà vertadera si l'any vinent el batlle de València, siga qui siga qui ocupe el càrrec en eixe moment, visita Castelló. Similarment, (239) és ambigua entre una lectura *de re* on Alba ignora que certa persona és l'assassí d'Smith, i una altra *de dicto* on ignora que tot assassí és culpable en virtut de la llei. Per als enunciats amb demostratius complexos, en canvi, l'única lectura disponible és la *de re*. Per exemple, (240) i (241) no presenten cap lectura contradictòria on un sol invidiu siga alhora xiquet i adult o una cadira tinga tres i quatre potes a la vegada; (242), per la seua banda, pot atribuir a Dídac una creença falsa, però no una de contradictòria. En la mesura que els demostratius complexos es comporten com a designadors rígids, pareix adient, i ben natural, modelar-los com a termes referencials.

Tanmateix, al llarg de les dues darreres dècades aquest model tradicional ha estat posat en qüestió arran d'un seguit de dades sobre usos *no-díctics* dels demostratius complexos. Els casos de *quantificació interna* (QI) (King 2001) en constituïxen l'exemple més evident:

(243) [Tota reina]$_1$ s'estima *aquell clergue que va coronar-la*$_1$

Pareix clar que (243) no expressa cap proposició singular que continga un individu entre els seus constituents, i açò entra en conflicte amb la idea que el valor semàntic del demostratiu complex que hi apareix vinga donat per un objecte. A banda del problema de la

quantificació interna, hi ha almenys cinc tipus addicionals de contraexemples a la teoria referencial:

Abast secundari (AS):

(244) Aquell professor que haja dut la subvenció més gran a cada departament rebrà un premi

Enunciats Bach-Peters:

(245) [Aquella amiga teua que va estudiar-hi$_1$]$_2$ va aprovar [aquell examen que (ella$_2$) temia]$_1$

Anàfora:

(246) [Un estudiant]$_1$ seia a la biblioteca. [Un altre estudiant]$_2$ hi$_1$ seia al costat. [Aquest estudiant]$_2$ tenia un llibre de lògica

Sense demostració i sense referència del parlant (SDSP):

(247) Aquell estudiant que haja tret un deu a l'examen és un geni

Variables lligades:

(248) [Tot estudiant] λ1. r$_1$ té un professor que creu que [eixe estudiant]$_1$ és un geni

Tots aquests contraexemples han dut molts autors a rebutjar la teoria tradicional dels demostratius complexos i a desenvolupar-ne d'alternatives, amb freqüència proposant d'entendre aquestes expressions com a un tipus especial de *quantificadors* (Neale 1993; King 1999, 2001; Lepore i Ludwig 2000). Altres autors (Roberts 2002, 2003; Elbourne 2008; Nowak 2014, 2019a, 2019b), malgrat no defendre teories quantificacionals, també es deslliuren d'alguns dels principis centrals del paradigma referencial, com ara la idea que siguen designadors rígids o instruments de referència directa.

L'objectiu d'aquesta tesi ha estat defendre les teories-c tot mostrant que tota l'evidència que se n'ha adduït en contra pot ser acomodada mitjançant alguns ajustaments independentment justificats. Un cop hom té en compte diversos fenòmens relacionats amb el poder expressiu del llenguatge natural, la noció de composicionalitat, el rol del context i la naturalesa de les relacions anafòriques, les teories-c poden ser fàcilment adaptades per tal de

fer front a tots sis tipus de contraexemples que hem esmentat a dalt. Encara més, les teories-c són les úniques capaces de predir acuradament el comportament dels demostratius complexos en fenòmens com ara l'anàfora, l'el·lipsi, el discurs indirecte i la interacció amb operadors modals i temporals. És per aquests motius que les teories-c constituïxen el model més parsimoniós del funcionament d'aquesta mena d'expressions.

La metodologia emprada al llarg d'aquesta tesi ha estat la típica de la semàntica composicional dins la tradició generativista, com a la teoria estàndard presentada a Heim i Kratzer (1998). En aquest paradigma, el significat de les expressions és entés com un objecte formal definit mitjançant *càlcul lambda tipat*. Aquests objectes poden ser d'un dels dos tipus bàsics (tipus *e* per a individus o tipus *t* per a valors de veritat) o d'un de derivat, que és definit com una funció d'elements d'un tipus a elements d'un altre. Per exemple, el tipus <*e*, *t*>, per a predicats, és una funció d'individus a valors de veritat, mentre que el tipus <<*e*, *t*>, <<*e*, *t*>, *t*>>, per a determinants, és una funció de parells de propietats a valors de veritat. La interpretació de les expressions complexes es duu a terme mitjançant la regla d'Aplicació Funcional: per a qualsevol sintagma α, si β i γ són els seus subcomponents immediats, i si β denota una funció dins el domini de la qual hi ha la denotació de γ, aleshores ⟦α⟧ = ⟦β⟧(⟦γ⟧), on ⟦ ⟧ és la funció que vincula cada expressió a la seua denotació o valor semàntic. Quan els dos subcomponents immediats d'un sintagma són del mateix tipus, com ara quan es combinen dos adjectius o un adjectiu i una oració de relatiu (tipus <*e*, *t*>), no hi ha possibilitat que la denotació de l'un es trobe en el domini de la denotació de l'altre, i en aquest cas el que cal aplicar és una regla per combinar-los i obtindre com a resultat una expressió del mateix tipus: si tenim "gos" i "gran", tots dos de tipus <*e*, *t*>, el sintagma "gos gran" també ho serà. Aquesta regla s'anomena Modificació del Predicat (Heim i Kratzer 1998: 125).

En semàntiques intensionals els valors semàntics són intensions, ço és, funcions que assignen a cada expressió l'extensió que els pertoca en diverses circumstàncies alternatives. La composició exacta d'aquestes circumstàncies és un tema de debat, i en aquesta tesi hem optat per dos paràmetres relativament incontrovertits: l'extensió d'una expressió depén d'un món possible i un instant de temps. A banda de la circumstància d'avaluació, els llenguatges amb díctics requerixen un paràmetre addicional, i més concretament un *context*. Els contexts s'entenen, en semàntica, com a objectes formals: són tuples d'objectes que servixen com a referents per als díctics. Un enunciat en un context determina un contingut, ço és, allò

asseverat per l'enunciat en qüestió; el contingut, al seu torn, és modelat com una funció de circumstàncies a extensions. A banda del context i la circumstància, hom també sol afegir una funció d'assignació entre els paràmetres necessaris per obtindre l'extensió d'una expressió, ja que aquestes funcions servixen per donar un valor a les variables lliures. Tanmateix, les variables lliures són, des d'un punt de vista formal, estrictament anàlogues als díctics (Kaplan 1989), de manera que la funció d'assignació pot ser considerada simplement com un altre paràmetre del context, entenent aquest com una tupla que conté tot allò necessari per tal de determinar el contingut de les expressions (incloent-hi les variables).

La darrera observació metodològica que cal fer té a vore amb els principis de combinació necessaris dins d'aquest sistema. Un cop hom hi introduïx dependència modal i temporal, hi ha dues maneres de reflectir-la al sistema formal: mitjançant operadors o, directament, amb quantificació explícita sobre mons possibles i instants de temps al llenguatge objecte. El primer d'aquests sistemes és probablement el més usual a l'hora de tractar llenguatges amb díctics en tant que permet de simplificar-ne les formes lògiques, però el segon és estàndard en les teories que versen sobre morfologia verbal i adverbis temporals i modals, ja que, tal com se sol reconèixer d'ençà del treball de Max Cresswell (1990), l'adopció de variables explícites de temps i mode és la manera més senzilla de capturar tot el poder expressiu del llenguatge natural. Açò vol dir que les circumstàncies han de ser representades explícitament a la forma lògica dels enunciats, i que tenen el seu propi tipus de denotació, el tipus *s*, que cal incorporar juntament amb els dos bàsics *e* i *t*.

Aquest ajustament és necessari i al llarg d'aquesta tesi se'n fa un ús extensiu, i és per això que també cal adoptar els principis de combinació que hi van emparellats. Les oracions de relatiu contenen un verb amb una determinada flexió (temps i mode), i és per això que, contràriament als adjectius o als noms comuns, fan referència explícita a un temps i un món. Això vol dir que la Modificació del Predicat no és suficient per interpretar combinacions de noms comuns i oracions de relatiu, ja que els primers tenen tipus $\langle e, \langle s, t\rangle\rangle$ i els altres, en canvi, són $\langle e, t\rangle$. Per aquest motiu, cal incorporar dos principis addicionals. El primer és la Identificació Individual (Kusumoto 1999, tot seguint Kratzer 1994a, 1994b), que permet de combinar dos predicats dels tipus que tot just acabem d'esmentar donant com a resultat un predicat complex de tipus $\langle e, \langle s, t\rangle\rangle$. D'altra banda, també ens cal un principi addicional a

favor del qual hem argumentat en aquesta tesi (secció 3.3.1.2): l'Especificació de la Circumstància, que permet de combinar un predicat de tipus <*e*, <*s*, *t*>> amb una circumstància (tipus *s*). Tenint totes aquestes eines formals, ja podem escometre la defensa de les teories-c que durem a terme en el present treball.

Una part important d'aquesta defensa de les teories tradicionals consistix a mostrar que les teories quantificacionals, i més en general qualsevol proposta que no tracte els demostratius complexos de la mateixa manera que la resta de díctics, genera prediccions errònies. Hem mostrat, per exemple, que la teoria quantificacional més coneguda, la de Jeffrey King (2001), està sotmesa a un seguit de problemes intensionals dels quals no se'n pot deslliurar amb facilitat. King tracta els demostratius complexos com a quantificadors que, a banda de la seua funció semàntica habitual, també es combinen amb propietats contextualment determinades. Aquestes propietat són fixades per les intencions del parlant i moltes vegades poden ser, senzillament, la propietat de ser idèntic a un individu (si assenyale Angela Merkel i dic "aquella dona", el demostratiu no només es combina amb la propietat *ésser una dona*, sinó també amb la d'*ésser Angela Merkel*). D'acord amb King, són aquesta mena de propietats les que generen els usos tradicionalment considerats com a referencials; en la terminologia de Kripke (1977: 21, nota 21), la rigidesa d'aquests usos dels demostratius complexos seria *de facto* i no *de iure*. El problema d'aquesta teoria és que genera un nombre excessiu de possibles lectures per als demostratius complexos, degudes fonamentalment a les diferències d'abast de quantificació; per exemple, prediu que (240)-(242) poden tindre lectures *de dicto*. Moltes d'aquestes són blocades per King mitjançant alguns principis controvertits sobre la naturalesa de les intencions del parlant, els quals hem criticat com a *ad hoc*. Allò ideal és que una teoria semàntica no es recolze en principis extralingüístics.

La segona teoria quantificacional més discutida, la de Ernst Lepore i Kirk Ludwig (2000) (secció 2.2.2), presenta complicacions similars a les de la proposta de King i, malgrat que aconseguix blocar moltes de les lectures problemàtiques gràcies a tractar "that" com a un terme que sempre és referencial, resulta inadequada per altres motius. Un d'ells és que genera prediccions errònies sobre casos de QI com (243). Un altre problema, més fonamental, és la sintaxi poc ortodoxa que fa servir: atés que mai no tracten "that" com a determinant sinó només com a pronom, han d'adoptar regles sintàctiques que generen un excés de sintagmes

nominals. Els calen, per exemple, regles com (249), que prediria que (250)-(251) són gramaticals:

(249) NP + N′ → NP

(250) #Ella presidenta del govern és alta

(251) #Aristòtil filòsof fou mestre de Plató

Lepore i Ludwig afirmen que la idea que els demostratius sempre contenen un element pronominal està atestada a diversos llenguatges arreu del món, però l'evidència que hi proporcionen pareix dubtosa. Per exemple, afirmen que la forma gramatical que necessiten, on un pronom demostratiu i un sintagma nominal es combinen amb un determinant vacu, està atestada al castellà, on hi ha demostratius complexos com ara el següent:

(252) El hombre ese

Tanmateix, Lepore i Ludwig obvien el fet que "*ese*", en aquest exemple, funciona com un adjectiu i no com un pronom. El valencià mateix n'és un important contraexemple, ja que en aquest idioma hi ha una distinció lèxica, i no només morfològica, entre els demostratius amb forma pronominal ("açò", "això", "allò") i els que funcionen com a adjectius o determinants ("aquest", "eixe", "aquell"). Altres contraexemples inclouen el xinés mandarí o el japonés.

Tal com hem esmentat adés, hi ha teories que, malgrat no tractar els demostratius complexos com a quantificadors, sí que s'allunyen molt del model estàndard que els tracta com qualsevol altre díctic. El tret central de propostes com ara les de Mark Richard (1993), Craige Roberts (2002, 2003) o Ethan Nowak (2014, 2019a) és que la part descriptiva del demostratiu (el sintagma nominal) entra a formar part, de manera generalitzada, d'allò asseverat per l'expressió. Com a conseqüència, totes elles acaben predint, en major o menor mesura, lectures errònies on els demostratius a (240)-(242) poden acabar caient sota l'abast d'operadors intensionals.

A banda d'aquesta dificultat bàsica, aquestes teories sovint patixen problemes específics, particularment amb el material pressuposicional que cadascuna d'elles associa als demostratius. A la proposta de Roberts, per exemple, el demostratiu està associat a la pressuposició que l'objecte que destria és el que més sobreïx, i això té com a conseqüència

que “això sobreïx” és una veritat analítica (o, almenys, que mai no és informativa). Pel que fa a Nowak (2019a), la seua teoria associa els demostratius complexos a dues pressuposicions: una d’unicitat i una altra de no-unicitat. Donada una expressió *e* amb la forma “aquell F que *p*”, on “F” és un sintagma nominal i “que *p*” és una oració de relatiu, *e* destria l’únic individu que satisfà les pressuposicions de no ser l’únic objecte que cau sota l’extensió d’“F” i ser l’únic que sí que satisfà “ser un *x* que *p*”. Si no hi ha cap oració de relatiu, es combina amb una propietat seleccionada contextualment, com ara la de ser idèntic a l’objecte assenyalat. Aquesta teoria aconseguix predir diversos contrasts importants pel que fa a l’acceptabilitat de molts enunciats amb demostratius complexos, i encaixa perfectament amb la idea que els demostratius complexos sense oració de relatiu només poden ser emprats referencialment (Wolter 2006), però com a contrapartida acaba predint que enunciats com el següent haurien de ser autocontradictoris, ja que el sintagma nominal entra en conflicte amb la pressuposició de no-unicitat:

(253) Aquest primer argument ha estat ben formulat

Finalment, un altre tipus de teories que són discutides i rebutjades són les que postulen que els demostratius complexos són expressions ambigües, ço és, amb dues entrades lèxiques distintes (secció 2.3). A banda de la manca de parsimònia que comporta el fet de complicar el lèxic innecessàriament, aquesta mena de teories no encaixen bé amb el fet que els demostratius complexos, des d’un punt de vista semàntic, es comporten gairebé de la mateixa manera arreu de la majoria d’idiomes.

És per totes aquestes raons que les teories tradicionals estan millor equipades per fer front als usos més habituals dels demostratius complexos. El que cal trobar és, doncs, una manera de fer-les compatibles amb l’evidència en contra presentada a (243)-(248). La versió de les teories-c que desenvolupe a aquesta tesi està dissenyada per fer-hi front. Per tal de vore quines modificacions cal implementar, vegem, en primer lloc, com es pot formular l’entrada lèxica de les teories-c clàssiques:

(254) $\lambda c.\ \lambda i.\ \lambda P\colon P(i_c)(d_c) = 1.\ d_c$,

on “c”, “i” i “P” són variables per a contexts, circumstàncies i propietats, respectivament, i, per a qualsevol context *k*, d_k n’és el *demonstratum* (l’objecte que més sobreïx) i i_k la circumstància privilegiada, ço és, la circumstància $\langle w_k, t_k \rangle$ que consta del

món i el temps de *k*. Aquesta entrada lèxica té problemes, fonamentalment, per fer front al problema de QI, car prediu que (243) és vertadera en un context *c* i una circumstància *i* si i sols si un determinat objecte, d_c, és estimat per totes les reines d'*i*, sota la pressuposició que d_c va coronar totes i cadascuna d'elles. També resulta inapropiada per als casos d'SDSP, ja que en principi el demostratiu complex a (247) no hauria de comportar-se com un designador rígid sota l'abast d'operadors modals:

(255) Josep creu que aquell estudiant que haja tret un deu a l'examen és un geni

Allò atribuït a Josep en aquest enunciat no hauria de ser una creença singular sobre un objecte particular, sinó més aviat una de general. Açò vol dir que l'extensió del demostratiu complex hauria de variar de circumstància a circumstància, ja que aquest és el paràmetre sobre el qual el verb "creure" quantifica. El problema s'agreuja quan considerem casos de QI en contexts intensionals.

Tot açò suggerix que hauríem de deslliurar-nos de la idea que el demostratiu complex selecciona un *demonstratum* contextualment destacat, ja que es aquesta la que fa que el demostratiu sempre reste ancorat a un individu. La idea mateixa que allò seleccionat per un demostratiu és l'objecte demostrat ja havia estat criticada amb anterioritat per altres motius, fonamentalment perquè duu a resultats erronis pel que fa a analiticitat i conseqüència lògica (Predelli 2012a; secció 3.1.1 d'aquesta tesi) i perquè és poc realista des d'un punt de vista psicològic (Nowak 2019b; secció 3.1.2 del present treball). Així doncs, pareix que ja tenim bons motius per a defer-nos-en. En la proposta defesa en aquesta tesi (secció 3.2), la idea que cada context privilegia un *demonstratum* és rebutjada; en el seu lloc, propose que cada context *c* continga una funció δ_c: $\Pi \rightarrow E$, on Π és el conjunt de totes les propietats i E el d'individus, de manera que, per a cada $P \in \Pi$, $P(i_c)(\delta_c(P)) = 1$. Dit altrament, el que fa la funció δ és combinar-se amb una propietat, comprovar quins objectes la satisfan en la circumstància del context, i seleccionar-ne un. El valor semàntic d'un demostratiu complex en un context ha de ser, senzillament, el valor que la funció δ assigne a la propietat designada pel nominal:

(256) $[\![\text{aquell}]\!] = \lambda c.\ \lambda P.\ \delta_c(P)$

Per exemple, el valor semàntic del demostratiu "aquell home" en un context *k* seria un individu, $\delta_k([\![\text{home}]\!]^k)$. Si $\delta_k([\![\text{home}]\!]^k)$ = Ximo Puig, aleshores el següent enunciat expressa una proposició que, en termes estructurats, podem representar com (257b):

(257a) Aquell home és president

(257b) <Ximo Puig, ésser president>

Per descomptat, aquesta proposició és singular i inclou un individu entre els seus constituents. Aquest model del funcionament dels demostratius complexos és estrictament anàleg al de la resta de díctics (són termes singulars dependents del context sense cap més contribució al contingut que un individu), i per tant no té cap dificultat pel que fa a l'evidència d'usos referencials canònics com (240)-(242). Aquesta versió de les teories-c, però, també pot fer front als contraexemples que s'han presentat contra les teories de la referència directa.

Pel que fa al problema principal, el de QI, aquesta entrada lèxica evita completament la més important de les dificultats: en aquests usos, el demostratiu complex ja no està ancorat a cap individu en particular. Si apliquem (254) a l'enunciat (243), el que obtenim és el següent: cada reina *x* determina una propietat diferent, la de ser un clergue que ha coronat l'individu *x*, i en conseqüència el demostratiu complex seleccionarà un individu distint per a cadascuna d'elles. Aquesta és la proposició expressada per (243) en un context *c*:

(258) λi. $\forall$x (x és reina en *i* $\rightarrow$ x s'estima δ_c (λj. λy. y va coronar x en j))

Per descomptat, per a cada *x* l'individu δ_c *(λj. λy. y va coronar x en j)* ha d'acomplir el requisit d'haver coronat *x* a la circumstància i_c. Açò suposa un avenç important per a les teories-c, ja que aquestes condicions de veritat no són les d'una proposició singular. Tanmateix, el resultat encara no és del tot correcte, car encara resta una dificultat: aquesta proposició és vertadera en una circumstància *i* si i sols si tota reina a *i* estima un individu que és un clergue i va coronar-la a una circumstància distinta, i_c. Malgrat no estar ancorat a un únic individu, el demostratiu encara depén massa del context. Aquesta idea, juntament amb els usos SDSP, fa pensar que alguns usos dels demostratius complexos han de dependre de la circumstància.

Aquest problema és resolt de dues maneres distintes, que he anomenat la *solució extensional* i la *solució de lligar la circumstància* (secció 3.3.1.3). Totes dues solucions

requerixen un recurs tècnic independentment justificat i que ja hem esmentat adés: l'adopció de variables explícites per a temps i mons i la quantificació a nivell de llenguatge objecte sobre aquests elements. La morfologia verbal és tractada de la mateixa manera que els pronoms: el present i l'indicatiu són referencials i sempre seleccionen el moment present i el món real, respectivament, mentre que la resta de temps i modes es tracten com a quantificadors capaços de lligar aquestes variables. Això vol dir que la circumstància d'avaluació és irrellevant, ja que el temps i el món on cal avaluar un enunciat ja estan esmentats de forma explícita a la forma lògica dels enunciats: tot el que ens cal és un context que indique quin món i temps són l'actual i real.

Si modelem la morfologia verbal d'aquesta manera, el problema que hem esmentat adés s'esvaïx. Aquest sistema requerix que el temps i el mode de tots els verbs de l'oració estiguen coordinats, i açò significa que, en totes aquelles ocasions en què el demostratiu complex continga una oració de relatiu, el seu contingut descriptiu haurà de ser avaluat a la mateixa circumstància que el verb de l'oració principal. Considereu la següent forma lògica, on les "t" i "w" són variables per a temps i mons, i "pres" i "ind" són *propietats-Φ* amb una semàntica pressuposicional que fa que les variables a què estan annexades destrien, respectivament, el temps i el món del context:

> LF de (243): $\langle w_0^{ind}, t_1^{pres}\rangle$ [Tota reina] λ2. r_2 s'estima *aquell clergue que*$_3$ *[∃*t_4*:* $t_4 < t_5^{pres}$*] (*$\langle w_6^{ind}, t_4\rangle$ r_3 *la*$_2$ *corona)*

Mentre tots dos verbs estiguen coordinats, no hi ha la possibilitat que siguen avaluats a circumstàncies distintes. Vet-ne ací les condicions de veritat predites (hi he subratllat la contribució del demostratiu):

> (259) λc. ∀x (x és reina en i_c → x s'estima $\underline{\delta_c\ (\lambda y.\ \lambda j.\ x \text{ és un clergue en } j\ \&\ [\exists t:\ t < t_c]\ (y \text{ corona } x \text{ en } \langle w_c, t\rangle))}$)

El resultat és, doncs, essencialment correcte, però aquesta solució potser resulte poc atractiva per a alguns autors. El motiu és que, en la mesura que el temps i el mode verbals són tractats com qualsevol altre díctic, aquest sistema es desfà de la noció mateixa d'intensió –és per això que he triat l'etiqueta "extensional" per referir-me a la solució que acabe d'esbossar–. Hi ha, però, una manera de recuperar les intensions: lligar la circumstància

principal dels enunciats amb un terme lambda i requerir que totes les variables marcades amb les propietats de present i indicatiu estiguen coindexades. També cal tractar els rastres de moviment dins les oracions de relatiu com a variables per a propietats (representades com una "R" majúscula a la següent forma lògica):

> LF de (243) (intensionalitzada): $\lambda<w_0^{ind}, t_1^{pres}>. <w_0^{ind}, t_1^{pres}>$ [Tota reina] $\lambda 2.\ r_2$ s'estima *aquell clergue que*$_3$ *[*$\exists t_4$*:* $t_4 < t_1^{pres}$*] (*$<w_0^{ind}, t_4>$ R_3 *corona* r_2*)*

El resultat d'avaluar aquesta forma lògica en un context qualsevol és una intensió que representa les condicions de veritat correctes d'aquest enunciat:

> (260) $\lambda c.\ \lambda i.\ \forall x$ (x és reina en *i* → x s'estima δ_c ($\lambda y.\ \lambda j.\ [\exists t: t < t_i]$ (y és un clergue en i & y va coronar x en $<w_i, t>$)))

En aquestes condicions de veritat, l'argument per a circumstàncies que la funció δ pren és irrellevant, i en conseqüència el demostratiu complex no és sensible a la circumstància del context. Siga quina siga la circumstància *i* proveïda per avaluar aquest enunciat, l'individu seleccionat per a cada reina *x* haurà d'haver coronat *x* al món d'*i* i en un moment anterior al temps d'*i*. Aquesta solució involucra lligar totes les circumstàncies que apareixen de forma explícita dins el demostratiu, i és per això que s'anomena "solució de lligar les circumstàncies".

Aquestes dues solucions mostren que qualsevol demostratiu que continga un verb flexionat pot perdre l'opacitat als operadors temporals i modals, fet que encaixa molt bé amb la idea assenyalada per Wolter (2006) i Nowak (2019a) que els únics demostratius que poden fer-se servir de manera no-díctica són els que contenen una oració de relatiu. El sistema, a més, prediu que els demostratius sense cap oració de relatiu, com ara els de (240)-(242), només poden ser emprats de manera referencial. Una altra virtut de la teoria és que permet de reduir molts dels casos d'SDSP com a instàncies especials de QI: només cal lligar les circumstàncies que hi apareixen (secció 3.3.5). Per exemple, (255) pot tindre una forma lògica com la següent, on el λ que lliga la circumstància interna al demostratiu és contribuït pel verb d'actitud proposicional (Cf. von Stechow 2003, 2004) (ho presente només per a la solució extensional, car la manera d'adaptar-ho a l'altra és òbvia):

> LF de (255): $<w_0^{ind}, t_1^{pres}>$ Josep creu $\lambda<w_2, t_3>. <w_2, t_3>$ *aquell estudiant que*$_4$ *[*$\exists t_5$*:* $t_5 < t_3$*] (*$<w_2, t_5>$ R_4 *trau un deu a l'examen)* és un geni

Avaluant aquesta forma lògica en qualsevol context assolim el resultat desitjat: la creença atribuïda a Josep no és sobre cap estudiant en particular.

(261) λc. Per a tota circumstància *i* compatible amb el que Josep creu a i_c, $\underline{\delta_c\ (\lambda y.\ \lambda j.\ [\exists t:\ t < t_i]\ (y \text{ és estudiant en } <w_j,\ t> \ \&\ y \text{ trau un deu a l'examen en } <w_j,\ t>))}$ és un geni en *i*)

Així doncs, les teories-c tenen la possibilitat de predir usos no-díctics per als demostratius complexos. Aquesta resposta contrasta amb les respostes que fins ara havien donat altres defensors d'aquestes teories (Cf. Braun 2008a), que apel·laven a la pragmàtica per tal de fer front a la contraevidència. Malgrat que en aquesta tesi no es descarten les solucions en termes pragmàtics, sí que hi defenc la possibilitat de tractar aquests problemes en termes semàntics. Açò no només permet d'oferir una solució unificada als problemes de QI i SDSP, sinó que, a més, encaixa molt bé amb l'evidència sobre l'ús del subjuntiu a les llengües romàniques (secció 3.3.5.3). Hi ha, a banda, un avantatge addicional: aquesta idea enceta la possibilitat de tractar com a QI alguns casos d'SDSP on les solucions en termes pragmàtics o no pareixien anar enlloc. Considereu el següent subjuntiu condicional, on la noció de referència directa pareix futil, car no hi ha cap objecte que satisfaga el contingut descriptiu del demostratiu (Nowak 2014):

(262a) Si Gore haguera guanyat les eleccions, hauria fet una abraçada a aquell elector que haguera dipositat la papereta decisiva

Al present sistema, aquest enunciat hauria de tindre la forma lògica proposada a (262b) (una versió extensionalitzada de la semàntica de Lewis-Stalnaker per a aquesta classe d'enunciats, on "C^w (p)" denota el conjunt de mons possibles més propers a g(w) on *p* és vertadera) i les condicions de veritat a (262c). Per simplicitat, en tots dos casos estic obviant la dependència temporal:

(262b) $[\forall w_1:\ w_1 \in C^{w_{ind}}$ (Gore guanya les eleccions)] (w_1 Gore fa una abraçada a aquell elector que$_2$ w_1 R_2 diposita la papereta decisiva))

(262c) λc. [∀w': w' es troba entre els mons més propers a w_c tals que Gore guanya les eleccions a w'] (Gore fa una abraçada a $\underline{\delta_c\ (\lambda y.\ \lambda w''.\ y \text{ és un elector a w' \& y diposita la papereta decisiva a w'})}$ a w')

Aquesta forma lògica i les condicions de veritat predites mostren que els demostratius complexos en oracions de subjuntiu condicional poden ser tractats com a instàncies particulars de QI. L'única diferència és que el que es lliga no és una variable per a individus, sinó per a mons; el resultat, però, és clar: el demostratiu seleccionarà un objecte distint en cada món possible. Aquestes idees, d'altra banda, també són aplicables als casos d'abast secundari, els quals són reconeguts per King mateix (2001: 173, nota 9) com un cas especial de QI.

Pel que fa a la resta de contraevidència, que inclou els casos d'anàfora, els enunciats Bach-Peters i els usos de demostratius complexos com a variables lligades, val a dir que, malgrat que no poden ser reduïts com a casos particulars de QI, sí que són instàncies de fenòmens més generals que suposen un problema no només per al cas dels demostratius complexos sinó, en general, per a la teoria estàndard de la dixi. L'anàfora en (246), per exemple, és un cas d'*anàfora de discurs*, que afecta els pronoms en general. La raó per la qual King (2008a) considera aquest enunciat com un contraexemple a la teoria referencial és que la idea que "aquest estudiant" estiga ancorat a un únic individu entra en conflicte amb que el valor de l'expressió depenga del del quantificador amb què està coindexat. Tanmateix, açò no és exclusiu dels demostratius complexos, sinó que afecta pronoms de tota mena:

(246a) [Un estudiant]$_1$ seia a la biblioteca. Un altre estudiant *hi*$_1$ seia al costat.

Les raons per les quals l'"hi" d'aquest exemple no pot ser referencial són les mateixes per les quals, a (246), "aquell estudiant" no pot ser-ho, fet que mostra que el que ocorre a (246) és una instància d'un fenomen més general conegut com a *covariació sense c-comandament*. Aquesta dificultat ja va ser assenyalada per Peter Geach (1962) i Gareth Evans (1977) com un problema a resoldre per als pronoms en general, i se n'han proposat diverses solucions, des de l'anàlisi dels pronoms problemàtics com a tipus-E tal com va proposar Evans mateix fins a les anàlisis de tipus-D (Heim 1990, Neale 1990) i diverses propostes al si de les semàntiques dinàmiques (Kamp 1981, Heim 1982, Groenendijk i Stokhof 1991). A la secció 3.3.4 examine com aplicar aquestes solucions per al cas particular dels demostratius complexos, i explique que els enunciats Bach-Peters poden ser explicats com una combinació de QI i covariació sense comandament-c. Allò important, però, és que la hipòtesi inicial de

les teories-c roman inalterada: els demostratius complexos han de ser entesos sota el model dels pronoms.

Aquesta hipòtesi, d'altra banda, encaixa ben naturalment amb els usos d'aquests demostratius com a variables lligades (secció 3.3.3). Al capdavall, tots els pronoms presenten usos lligats:

(263) [Tota reina] λ1. creu que algun dia ella$_1$ arribarà a ser emperadiu

(264) [Només jo] λ2. vaig votar per mi$_2$ mateix

La raó per la qual aquests usos particulars de demostratius complexos no són referencials és, senzillament, que cal operar-ne sobre el caràcter (Rabern 2013). L'única diferència entre els demostratius complexos i els pronoms díctics habituals és, senzillament, que hi ha dues maneres d'actuar sobre el caràcter d'un demostratiu complex: o bé lligant-lo, o be mitjançant QI. Açò significa, d'altra banda, que el nostre sistema ha d'incorporar operadors hiperintensionals, contràriament al que Kaplan (1989) va defendre. Malgrat que la presència d'aquests operadors no està lliure de controvèrsia, pareix nogensmenys justificada en la mesura que és la millor manera de conservar la idea que els pronoms poden ser utilitzats per expressar proposicions singulars i, tanmateix, també poden presentar usos lligats (secció 3.3.2.1). La qüestió de si l'etiqueta "referència directa" pot ser aplicada a un sistema com aquest és un tema de debat, però es tracta fonamentalment d'una qüestió nominal (secció 3.3.2.2).

Així doncs, les teories-c només requerixen alguns ajustaments independentment justificats per tal de fer front a tota l'evidència que se n'ha presentat en contra. Aquests resultats, juntament amb la manera natural en què aquestes teories expliquen la impossibilitat de dobles lectures a (240)-(242), apunten cap a una important conclusió: les teories-c són la manera més parsimoniosa de tractar els demostratius complexos. Aquesta idea, d'altra banda, és reforçada pel fet que aquestes expressions es comporten com qualsevol altre díctic, i de forma molt diferent als quantificadors, pel que fa a fenòmens com ara l'anàfora o l'el·lipsi (secció 3.4). Considereu el contrast següent (Higginbotham 1988):

(265a) Laura odia l'home que seu al seu costat, però Júlia l'estima

(265b) Laura odia aquell home que seu al seu costat, però Júlia l'estima

(266a) Laura odia l'home que seu al seu costat, i Júlia també

(266b) Laura odia aquell home que seu al seu costat, i Júlia també

L'anàfora a (265a) genera una doble lectura: Júlia pot odiar el mateix home que Laura odia o el que seu al seu propi costat. Tanmateix, la que hi ha a (265b) només pot ser resolta atribuïnt a Júlia estima envers l'home al costat de Laura. Els fets a (266a-b) són similars: la primera presenta dues lectures, però l'única lectura possible per a la segona és una on Júlia i Laura senten odi envers la mateixa persona. Açò mostra que el funcionament dels demostratius complexos en anàfora i el·lipsi és estrictament anàleg al dels pronoms, que només poden presentar una lectura, i essencialment diferent al dels quantificadors, que sempre en generen més d'una:

(267) Laura l'estima, i Júlia també

(268) Laura odia tots els hòmens que coneix, però Júlia els estima

Les teories-c constituïxen, per tant, la millor manera d'entendre els demostratius complexos: són termes singulars que depenen del context i que contribuïxen únicament un individu al contingut expressat, llevat dels casos on un operador hiperintensional hi intervé.

Aquestes conclusions apunten cap a una concepció de la noció de context ben diferent de la que tradicionalment hom ha sostingut en semàntica. Al llarg d'aquesta tesi hem defés la inclusió de les funcions d'assignació com un paràmetre més del context, la idea que la funció δ seleccione un individu per a cada propietat, la quantificació explícita sobre mons i temps i la possibilitat d'operar sobre diversos paràmetres del context; a tot açò, a més, cal sumar-hi el rebuig de la condició que l'objecte seleccionat siga contextualment demostrat. Totes aquestes qüestions suggerixen que el context, com a constructe formal, ha de fixar un nombre de paràmetres que difícilment poden ser determinats observant aspectes objectius i fàcilment discernibles arran de la situació de proferiment de l'enunciat. Hi entren en joc factors molt més subjectius i bastant més complexos que fan pensar que el context, lluny de ser la representació formal d'una situació real de parla, ha de ser concebut, més aviat, com una col·lecció de paràmetres l'obtenció dels quals no és tan senzilla com s'havia pensat d'ençà que Kaplan (1977) n'introduí la noció. El procediment de posar cada context formal en relació amb una situació concreta de parla està lluny de ser immediata; potser paga la pena, doncs, deslliurar-nos de la noció mateixa de context, que tanta confusió ha generat al

si de la semàntica (Predelli 2005a), i fer-ne servir una altra. La funció d'assignació, per exemple, és un candidat perfecte per exercir-ne el rol (seccions 3.3.3 i 4).

6 Bibliography

Altshuler, D. (2007). WCO, ACD and what they reveal about complex demonstratives. *Natural Language Semantics*, *15*, 265-277.

Austin, J. L. (1950). Truth. *Proceedings of the Aristotelian Society Supplementary Volume*, *24*(1), 111–172.

Bach, E. (1970). Problominalization. *Linguistic Inquiry*, *1*, 121-122.

Bach, E., & Cooper, R. (1978). The NP-S analysis of relative clauses and compositional semantics. *Linguistics and Philosophy*, *2*(1), 145-150.

Ball, D. (2017). What Are We Doing when We Theorize about Context Sensitivity? In J. J. Ichikawa (Ed.), *The* Routledge *Handbook of Epistemic Contextualism* (pp. 105–118). Abingdon: Routledge.

Barwise, J., & Cooper, R. (1981). Generalized quantifiers and natural language. *Linguistics and Philosophy*, *4*, 159–219.

Barwise, J. & Perry, J. (1983). *Situations and attitudes*. Cambridge (Massachusetts): MIT Press.

Borg, E. (2000). Complex demonstratives. *Philosophical Studies*, *97*, 229-49.

Borg, E. (2002). Pointing at Jack, talking about Jill: understanding deferred uses of demonstratives and pronouns. *Mind & language*, *17*(5), 489-512.

Borg, E. (2004). *Minimal semantics*. New York: Oxford University Press.

Borg, E. (2019). Explanatory roles for minimal content. *Noûs*, *53*(3), 513-539.

Burge, T. (1974). Demonstrative Constructions, Reference and Truth. *Journal of Philosophy*, *71*, 205–23.

Braun, D. (1994). Structured characters and complex demonstratives. *Philosophical Studies*, *74*, 193-219.

Braun, D. (1996). Demonstratives and their linguistic meanings. *Nous*, *30*(2), 145-173.

Braun, D. (2008a). Complex demonstratives and their singular contents. *Linguistics and Philosophy*, *31*(1), 57-99.

Braun, D. (2008b). Problems for a quantificational theory of complex demonstratives. *Philosophical Studies, 140*(3), 335-358.

Braun, D. (2008c). Persisting problems for a quantificational theory of complex demonstratives. *Philosophical Studies, 141*(2), 243-262.

Briciu, A. (2018). On Context Shifters and Compositionality in Natural Languages. *Organon F*, *25*(1), 2-20.

Bruening, B. (2009). Selectional asymmetries between CP and DP suggest that the DP hypothesis is wrong. *University of Pennsylvania working papers in linguistics, 15*(1), 27-35.

Burleigh, W. (1955). *De Puritate Artis Logicae Tractatus Longior, with a revised edition of the Tractatus Brevior*. New York: Franciscan Institute Publications. (Reprinted from *De Puritate Artis Logicae Tractatus Longior,* 1328).

Cappelen, H. (2012). *Philosophy without intuitions*. Oxford: Oxford University Press.

Cappelen, H. & Lepore, E. (2002). Indexicality, binding, anaphora and a priori truth. *Analysis 62*(4), 271-81.

Cappelen, H. & Lepore, E. (2005). *Insensitive Semantics: a defense of semantic minimalism and speech act pluralism*. Oxford: Blackwell.

Carnap, R. (1947). *Meaning and Necessity*, Chicago: University of Chicago Press.

Carson, T. L. (2010). *Lying and deception: theory and practice*. Oxford: Oxford University Press

Chalmers, D. (2006). The foundations of two-dimensional semantics. In M. García-Carpintero & J. Macià (Eds.), *Two-dimensional Semantics* (pp. 55-140). New York: Oxford University Press.

Chomsky, N. (1970). Remarks on nominalization. In R. A. Jacobs & P. S. Rosenbaum *(eds.) Readings in English Transformational Grammar* (pp. 184-221). Waltham: Ginn.

Chomsky, N. (1975). *Questions of Form and Interpretation*. Walter de Gruyter.

Chomsky, N. (1981). *Lectures on Government and Binding*. Dordrecht: Foris Publications.

Chomsky, N. (1986). *Knowledge of Language: its Nature, Origin and Use*. New York: Praeger Publishers.

Chomsky, N. (2015). *The Minimalist Program*. Cambridge (Massachusetts): MIT Press. (Reprinted from *The Minimalist Program*, 1995, Cambridge (Massachusetts): MIT Press).

Corazza, E. (2002a). Description-Names. *Journal of Philosophical Logic*, *31*, 313–326.

Corazza, E. (2002b). "She" and "he". Politically correct pronouns. *Philosophical Studies*, *111*, 173-196.

Corazza, E. (2003). Complex demonstratives qua singular terms. *Erkenntnis*, *59*(2), 263-283.

Corazza, E., Fish, W., Gorvett, J. (2002). Who is I. *Philosophical Studies*, *107*, 1–21.

Cresswell, M. (1990). *Entities and indices*. Dordrecht: Kluwer Academic.

Crossley, J., & Humberstone, L. (1977). The logic of "actually". *Reports on Mathematical Logic*, *8*, 11–29.

Davidson, D. (1967). Truth and Meaning. *Synthese*, *17*(3), 304-323.

de Ponte, M., Korta, K. & Perry, J. (2020). Utterance and Context. In T. Ciecierski & P. Grabarczyk (Eds.), *The Architecture of Context and Context-Sensitivity. Perspectives from Philosophy, Linguistics and Logic* (pp. 15-28). Cham: Springer.

del Prete, F., & Zucchi, A. (2017). A unified non-monstrous semantics for third-person pronouns. *Semantics & Pragmatics*, *10*(10).

Dever, J. (2001). Complex demonstratives. *Linguistics and Philosophy*, *24*, 271-330.

Diessel, H. (1999). *Demonstratives: Form, function and grammaticalization*. John Benjamins Publishing.

Donnellan, K. (1966). Reference and Definite Descriptions. *The Philosophical Review*, *75*, 281-304.

Dummett, M. (1973). *Frege: Philosophy of Language*. London: Duckworth.

Enç, M. (1987). Anchoring Conditions for Tense. *Linguistic Inquiry, 18*, 633-657

Evans, G. (1977a). Pronouns, quantifiers and relative clauses (I). *Canadian Journal of Philosophy*, *7*(4), 467-536.

Evans, G. (1977b). Pronouns, quantifiers and relative clauses (II). *Canadian Journal of Philosophy*, *7*(4), 777-797.

Evans, G. (1979). Reference and contingency. *The Monist, 62*(2), 161-189

Evans, G. (1980). Pronouns. *Linguistic Inquiry, 11*, 337-362.

Elbourne, P. D. (2005). *Situations and Individuals*. Cambridge (Massachusetts): MIT Press.

Elbourne, P. D. (2008). Demonstratives as individual concepts. *Linguistics and Philosophy*, *31*(4), 409-466.

Fodor, J. D. (1970). *The linguistic description of opaque contexts*. Ph.D. dissertation, Massachusetts Institute of Technology.

Frege, G. (1931). *Begriffsschrift*, a formula language, modeled upon that of arithmetic, for pure thought. In J. van Heijenoort (Ed.), *From Frege to Gödel: A source book in mathematical logic, 1879-1931* (pp. 1–82). Cambridge (Massachusetts): Harvard University Press. (Reprinted from *Begriffsschrift, eine der arithmetischen nachgebildete Formelsprache des reinen Denkens*, 1879, Halle: Verlag von Louis Nebert).

Frege, G. (1981a). Función y concepto. In *Frege: Estudios Sobre Semántica* (pp. 18-48) Barcelona: Orbis. (Reprinted from Funktion und Begriff, by G. Frege, 1891).

Frege, G. (1981b). Sentido y referencia. In *Frege: Estudios Sobre Semántica* (pp. 50-86). Barcelona: Orbis. (Reprinted from Über Sinn und Bedeutung, by G. Frege, *Zeitschrift für Philosophie und philosophische Kritik, 100*, 25–50, 1892).

García-Carpintero, M. (1998). Indexicals as token-reflexives. *Mind, 107*(427), 529-564.

García-Carpintero, M. (2000). A presuppositional account of reference fixing. *The Journal of Philosophy, 97*(3), 109-147.

García-Carpintero, M. (2006). Two-dimensionalism: a Neo-Fregean interpretation. In M. García-Carpintero & J. Macià (Eds.), *Two-dimensional Semantics* (pp. 181-204). New York: Oxford University Press.

García-Carpintero, M. (2018). The Mill-Frege theory of proper names. *Mind*, *127*(508), 1107-1168.

García-Carpintero, M. & Macià, J. (eds.) (2006). *Two-dimensional Semantics*. New York: Oxford University Press.

Gauker, C. (2010). Contexts in Formal Semantics. *Philosophy Compass*, *5*(7), 568–578.

Geach, P. T. (1962). *Reference and generality: An examination of some medieval and modern theories*. London: Cornell University Press.

Georgi, G. (2012). Reference and ambiguity in complex demonstratives. In W. Kabasenche, M. O'Rourke & M. H. Slater (Eds.), *Reference and Referring* (pp. 357-384). Cambridge (Massachusetts): MIT Press.

Georgi, G. (2015). Logic for languages containing referentially promiscuous expressions. *Journal of Philosophical Logic*, *44*(4), 429-451.

Georgi, G. (2019). Contexts and constraints of use. Forthcoming in *Theoria*.

Georgi, G. (2020). Demonstratives in First-Order Logic. In T. Ciecierski & P. Grabarczyk (Eds.), *The Architecture of Context and Context-Sensitivity. Perspectives from Philosophy, Linguistics and Logic* (pp. 125-148). Cham: Springer.

Gimeno-Simó, J. (2018). Locating Oneself in Imagination: First-Person Indexicals and Context-Shifting. *Teorema: Revista Internacional de Filosofía*, *37*(2), 55-74.

Gimeno-Simó, J. (2019). Semàntica i pragmàtica, contingut i context. *Quaderns de filosofia*, *6*(2), 91-127.

Gimeno-Simó, J. (2020a). De la filosofía a la lingüística: la teoría de las descripciones como contribución a la semántica. In J. Gimeno-Simó, V. J. Luque & S. Pérez-González (Eds.), *Bertrand Russell: Herencia y Actualidad*. València: Editorial Tirant.

Gimeno-Simó, J. (2020b). *De Se* as Variable Binding: On Context-Sensitivity in Utterance Reports. In T. Ciecierski & P. Grabarczyk (Eds.), *The Architecture of Context and Context-Sensitivity. Perspectives from Philosophy, Linguistics and Logic* (pp. 149-178). Cham: Springer.

Gimeno-Simó, J. (manuscript). May monsters be harmless for compositionality?

Glanzberg, M. (2012). Not All Contextual Parameters Are Alike. Unpublished ms.

Glanzberg, M. (2018). On Explanation and Partiality in Semantic Theory. In A. Burgess & B. Sherman (Eds.), *Metasemantics: New Essays on the Foundations of Meaning* (pp. 259-292). New York: Oxford University Press.

Glanzberg, M. (2020). Indirectness and Intentions in Metasemantics. In T. Ciecierski & P. Grabarczyk (Eds.), *The Architecture of Context and Context-Sensitivity. Perspectives from Philosophy, Linguistics and Logic* (pp. 29-53). Cham: Springer.

Glanzberg, M. & King, J. C. (2020). Binding, compositionality, and semantic values. *Philosopher's Imprint*, *20*(2), 1-29.

Glanzberg, M., & Siegel, S. (2006). Presupposition and policing in complex demonstratives. *Noûs*, *40*(1), 1-42.

Grice, H. P. (1961). The Causal Theory of Perception. *Proceedings of the Aristotelian Society,* Supplementary *Volume 35*, 121–52.

Grice, H. P. (1975). Logic and conversation. In P. Cole & J. Morgan (Eds.), *Syntax and* Semantics, *3: Speech Acts* (pp. 41–58). New York: Academic Press.

Grice, H. P. (1978). Further Notes on Logic and Conversation. In P. Cole (Ed.), *Syntax and Semantics 9: Pragmatics* (pp. 113-128). New York: Academic Press.

Grimaltos, T., & Rosell, S. (2013). On Lying: A Conceptual Argument for the Falsity Condition. Ms.

Grimaltos, T., & Rosell, S. (2017). More and More Lies. A New Distinction and Its Consequences. *Teorema: Revista Internacional de Filosofía*, *36*(1), 5-21.

Groenendijk, J. & Stokhof, M. (1991). Dynamic Predicate Logic. *Linguistics & Philosophy*, *14*, 39-100.

Grosz, P. G., Patel-Grosz, P., Fedorenko, E., & Gibson, E. (2015). Constraints on donkey pronouns. *Journal of Semantics, 32*(4), 619-648.

Grover, D. (1992). *A prosentential theory of truth*. Princeton, NJ: Princeton University Press.

Heim, I. (1982). *The Semantics of Definite and Indefinite Noun Phrases*. Ph.D. dissertation, Massachusetts Institute of Technology.

Heim, I. (1990). E-Type Pronouns and Donkey Anaphora. *Linguistics and Philosophy*, *13*(2), 137–177.

Heim, I. (2008). Features on bound pronouns. In D. Harbor, D. Adger & S. Bejar (eds.), *Phi theory: Phi-features across modules and interfaces* (pp. 35–56). Oxford: Oxford University Press.

Heim, I. & Kratzer, A. (1998). *Semantics in generative grammar*. Oxford: Blackwell.

Heim, I. & von Fintel, K. (2011). *Intensional Semantics*.

Higginbotham, J. (1988). Contexts, models, and meanings: a note on the data of semantics. In R. M. Kempson (Ed.), *Mental representations: The interface between language and reality* (pp. 29–48). Cambridge: Cambridge University Press.

Higginbotham, J., & May, R. (1981). Questions, Quantifiers, and Crossing. *Linguistic Review*, *1*, 41-80.

Horn, L. R. (1985). Metalinguistic negation and pragmatic ambiguity. *Language*, 121-174.

Hornstein, N. (1995). *Logical form*. Oxford: Blackwell.

Iacona, A. (2009). Validity and interpretation. *Australasian Journal of Philosophy*, *88*(2), 247-264.

Iacona, A. (2010). Truth preservation in any context. *American Philosophical Quarterly*, *47*(2), 191–199.

Israel, D. & Perry, J. (1996). Where monsters dwell. In J. Selligman & D. Westerståhl (Eds.), *Logic, language and computation, vol. 1* (pp. 303-316). Stanford: CSLI Publications.

Jackendoff, R. (1977). *X syntax: A study of phrase structure*. Cambridge (Massachusetts): MIT Press.

Jacobson, P. (1979). *The Syntax of Crossing Coreference Sentences*. Ph.D. dissertation, University of California, Berkeley.

Jacobson, P. & Gibson, E. (2014). Processing of ACD gives no evidence for QR. In T. Snider, S. D'Antonio & M. Weigand (Eds.), *Proceddings of the 14th Semantics and Linguistics Conference* (pp. 156-176).

Jaszczolt, K. & Huang, M. (2017). Monsters and I: the case of mixed quotation. In P. Saka & M. Johnson (Eds.), *The Semantics and Pragmatics of Quotation* (pp. 357-382). Cham: Springer.

Kamp, H. (1971). Formal Properties of 'Now'. *Theoria*, *37*, 227–273.

Kamp, H. (1981). A theory of truth and semantic representation. In J. Groenendijk et al. (eds.) *Truth, Interpretation and Information* (pp.1-41). Foris: Dordrecht.

Kaplan, D. (1968). Quantifying in. *Synthese*, *19* (1-2), 178-214.

Kaplan, D. (1976). How to Russell a Frege-Church. *The Journal of Philosophy*, *72*(19), 716-729.

Kaplan, D. (1977). Demonstratives. In J. Almog, J. Perry & H. Wettstein (Eds.), *Themes from Kaplan* (pp. 481-563). Oxford: Oxford University Press, 1989.

Kaplan, D. (1978). Dthat. In P. Cole (Ed.), *Syntax and Semantics 9: Pragmatics*. New York: Academic Press.

Kaplan, D. (1989). Afterthoughts. In J. Almog, J. Perry & H. Wettstein (Eds.), *Themes from Kaplan* (pp. 565-614). Oxford: Oxford University Press, 1989.

Keller, L. J., & Keller, J. A. (2013). Compositionality and structured propositions. *Thought: A Journal of Philosophy*, *2*(4), 313–323.

Keenan, E. L., & Stavi, J. (1986). A semantic characterization of natural language determiners. *Linguistics and philosophy*, *9*, 253-326.

King, J. C. (1995). Structured propositions and complex predicates. *Noûs*, *29*(4), 516–535

King, J. C. (1999). Are complex 'that' phrases devices of direct reference? *Nous*, *33*(2), 155-182.

King, J. C. (2001). *Complex demonstratives. A quantificational account*. Cambridge (Massachusetts): MIT Press.

King, J. C. (2008a). Complex demonstratives as quantifiers: objections and replies. *Philosophical studies*, *141*(2), 209-242.

King, J. C. (2008b). Complex demonstratives, QI uses, and direct reference. *The Philosophical review*, *117*(1), 99-117.

King, J. C. (2014a). Supplementives, the coordination account and conflicting intentions. In A. Burgess & B. Sherman (Eds.), *Metasemantics: New Essays on the Foundations of Meaning* (pp. 97-118). New York: Oxford University Press.

King, J. C. (2013). On fineness of grain. *Philosophical Studies*, 163(3), 763–781.

King, J. C. (2014b). Speaker intentions in context. *Noûs*, *48*(2), 219-237.

King, J. C. (2019). On propositions and fineness of grain (again!). *Synthese*, *196*(4), 1343-1367.

King, J. C. (2020). Speaker intentions and objective metasemantics. In T. Ciecierski & P. Grabarczyk (Eds.), *The Architecture of Context and Context-Sensitivity. Perspectives from Philosophy, Linguistics and Logic* (pp. 55-79). Cham: Springer.

King, J. C. & Lewis, K. S. (2018). Anaphora. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*, fall 2018 edition. URL: https://plato.stanford.edu/archives/fall2018/entries/anaphora/

Korta, K. & de Ponte, M. (2014). Tenses, dates and times. *Research in Language*, *12*(4), 301-317.

Korta, K. & Perry J. (2011). *Critical Pragmatics. An Inquiry into Reference and Communication.* Cambridge: Cambridge University Press.

Kratzer, A. (1996). Severing the external argument from its verb. In J. Rooryck & L. Zaring (Eds.), *Phrase Structure and the Lexicon* (pp. 109-137). Springer

Kratzer, A. (1998a). More structural analogies between tenses and pronouns. In D. Strolovitch & A. Lawson, *Proceedings of SALT VIII* (pp. 92-110).

Kratzer, A. (1998b). Scope or pseudoscope? Are there wide-scope indefinites? In S. Rothstein (Ed.), *Events and grammar* (pp. 163–198). Dordrecht: Kluwer.

Kratzer, A. (2009). Making a pronoun: Fake indexicals as windows into the properties of pronouns. *Linguistic Inquiry*, *40*(2), 187-237.

Kripke, S. (1972). *Naming and Necessity*. Oxford: Basil Blackwell, 1980.

Kripke, S. (1977). Speaker's Reference and Semantic Reference. In T. E. French et al (Eds.) *Contemporary Perspectives in Philosophy of Language* (pp. 6-27). Minneapolis: University of Minnesota Press.

Kusumoto, K. (1999). *Tense in embedded contexts*. Ph.D. dissertation, University of Massachusetts, Amherst.

Larson, L. & Ludlow, P. (1993). Interpreted Logical Form. *Synthese*, 95, 305-555.

Larson, R., & Segal, G. (1995). *Knowledge of meaning: An introduction to semantic theory*. Cambridge (Massachusetts): MIT Press.

Ledgeway, A. (2012). *From Latin to Romance: Morphosyntactic typology and change (Vol. 1*). Oxford: Oxford University Press.

Lepore, E. & Ludwig, K. (2000). The Semantics and Pragmatics of Complex Demonstratives. *Mind, 109*, 199-240.

Lepore, E., & Johnson, K. (2002). Does syntax reveal semantics? A case study of complex demonstratives. *Nous*, *36*(s16), 17-41.

Lewis, D. (1970). General Semantics. *Synthese, 22*, 18-67.

Lewis, D. (1973). *Counterfactuals*. Oxford: Basil Blackwell.

Lewis, D. (1979). Attitudes *de dicto* and *de se*. *The philosophical review*, *88*(4), 513-543.

Lewis, D. (1980). Index, context and content. In S. Kanger & S. Öhman (Eds.), *Philosophy and Grammar* (pp.79-100). Dordrecht: Reidel Publishing.

Lindström, P. (1966). First-order logic with generalized quantifiers. *Theoria*, *32*, 186-195.

MacFarlane, J. (2003). Three grades of truth-relativity. Ms.

Maclaran, R. (1982). The Semantics and Pragmatics of the English Demonstratives. Ph.D. dissertation, Cornell University.

May, R. (1977). *The Grammar of Quantification*. Ph.D. thesis, MIT.

Mates, B. (1973). Descriptions and reference. *Foundations of Language*, *10*(3), 409-418.

May, R. (1985). *Logical Form: Its Structure and Derivation*. Cambridge (Massachusetts): MIT Press.

McCullagh, M. (2018). Kinds of monsters and kinds of compositionality. *Analysis*, *78*(4), 657-666.

McCullagh, M. (2020). Distributed utterances. In T. Ciecierski & P. Grabarczyk (Eds.), *The Architecture of Context and Context-Sensitivity. Perspectives from Philosophy, Linguistics and Logic* (pp. 113-124). Cham: Springer.

Mill, J. S. (1869). *A System of Logic, Ratiocinative and Inductive: Being a Connected View of the Princilples of Evidence and the Methods of Scientific Investigation*. Harper and brothers.

Mithun, M. (1987). The grammatical nature and discourse power of demonstratives. *Annual meeting of the Berkeley linguistics society*, 13: 184-194.

Montague, R. (1970). Universal Grammar. *Theoria*, *36*, 373-398.

Montague, R. (1974). The proper treatment of quantification in ordinary English. In K. J. J. Hintikka, J. Moravcsik, & P. Suppes (Eds.), *Approaches to Natural Language* (pp. 221–242). Dordrecht: Reidel.

Mostowski, A. (1957). On a generalization of quantifiers. *Fundamenta Mathematicae*, *44*, 12-36.

Musan, R. (1995). *On the temporal interpretation of noun phrases*. Ph.D. dissertation, Massachusetts Institute of Technology.

Neale, S. (1990a). *Descriptions*. Cambridge (Massachusetts): MIT Press.

Neale, S. (1990b). Descriptive pronouns and donkey anaphora. *The Journal of Philosophy*, *87*(3): 113-150.

Neale, S. (1993). Term limits. *Philosophical Perspectives*, *7*, 89-123.

Neale, S. (1999). Coloring and composition. In R. Stainton (Ed.), *Philosophy and linguistics*, pp. 35-82). Westview Press.

Neale, S. (2006). Ontological Symmetry in Language: a Brief Manifesto. *Mind & Language*, *21*(4), 504-539.

Nowak, E. (2014). Demonstratives without rigidity or ambiguity. *Linguistics and Philosophy*, *37*(5), 409-436.

Nowak, E. (2019a). Complex demonstratives, hidden arguments and presupposition. Forthcoming in *Synthese*.

Nowak, E. (2019b). No context, no content, no problem. Forthcoming in *Mind & Language*.

Nunberg, G. (1993). Indexicality and deixis. *Linguistics and Philosophy, 16*, 1-43.

Ogihara, T. (1989). *Temporal reference in English and Japanese*. Ph.D. dissertation, University of Texas, Austin.

Ogihara, T. (1995). The semantics of tense in embedded clauses. *Linguistic Inquiry*, *26*, 663-679.

Ogihara, T. (1996). *Tense, attitude and scope*. Kluwer: Dordrecht Publishers.

Ogihara, T. & Sharvit, Y. (2012). Embedded tenses. In R. Binnick (Ed.), *The Oxford Handbook of Tense and Aspect* (pp. 638–668). Oxford and New York: Oxford University Press.

Pagin, P., & Westerståhl, D. (2010a). Compositionality I: Definitions and variants. *Philosophy Compass*, *5*(3), 250-264.

Pagin, P., & Westerståhl, D. (2010b). Compositionality II: Arguments and problems. *Philosophy Compass*, *5*(3), 265-282.

Partee, B. (1973). Some structural analogies between tenses and pronouns in English. *The Journal of Philosophy*, *LXX*(18), 601-609.

Partee, B. (1975). Montague grammar and transformational grammar. *Linguistic inquiry*, *6*(2), 203-300.

Partee, B. (1987). Noun phrase interpretation and type-shifting principles. In J. A. G. Groenendijk, D. de Jongh, and M. J. B. Stokhof (Eds.), *Studies in Discourse* Representation *Theory and the Theory of Generalized Quantifiers* (pp. 115-143). Foris: Dordrecht.

Partee, B. & Rooth, M. (1983). Generalized conjunction and type ambiguity. In R. Bauerle, C. Schwarze & A. von Stechow (Eds.), *Meaning, Use and Interpretation of Language* (361-383). Berlin: Walter de Gruyter.

Perry, J. (1977). Frege on demonstratives. *The philosophical review*, *86*(4), 474-497.

Perry, J. (1979). The problem of the essential indexical. *Noûs*, 3-21.

Perry, J. (1988). Cognitive Significance and New Theories of Reference. *Noûs*, *22*, 1–18.

Perry, J. (2001). *Reference and Reflexivity*. Stanford: CSLI Publications.

Perry, J. (2017). The semantics and pragmatics of indexicals. In B. Hale, C. Wright & A. Miller (Eds.), *A companion to the philosophy of language. 2nd edition* (pp. 970-989). Oxford: Blackwell.

Pickel, B. (2018). Structured propositions and trivial composition. Forthcoming in *Synthese*.

Pickel, B. (2019). Structured Propositions in a Generative Grammar. *Mind, 128,* 329-366.

Pickel, B., & Rabern, B. (2020). The myth of occurrence-based semantics. Forthcoming in *Linguistics and Philosophy*.

Pietroski, P. (2008). Logical form and LF. In E. Lepore & B. C. Smith (Eds.) *The Oxford Handbook of Philosophy of Language* (pp. 822-844). Oxford: Oxford University Press.

Pietroski, P. (2018). Semantic Typology and Composition. In B. Rabern & D. Ball (Eds.), *The Science of Meaning. Essays on the Metatheory of Natural Language Semantics* (pp. 306-333). New York: Oxford University Press.

Postal, P. (1969). Anaphoric islands. *Chicago Linguistic Society, 5,* 205-239.

Predelli, S. (1998a). I am not here now. *Analysis, 58*(2), 107-115.

Predelli, S. (1998b). Utterance, interpretation and the logic of indexicals. *Mind & Language, 13*(3), 400-414.

Predelli, S. (2001). Complex demonstratives and anaphora. *Analysis, 61*(1), 53-59.

Predelli, S. (2004). Think before you speak: Utterances and the logic of indexicals. *Argumentation, 18*(4), 445-463.

Predelli, S. (2005a). *Contexts: Meaning, truth and the use of language*. Oxford: Oxford University Press.

Predelli, S. (2005b). Painted Leaves, Context and Semantic Analysis. *Linguistics and Philosophy, 28*, 351-374.

Predelli, S. (2008). I Exist: The Meaning of "I" and the Logic of Indexicals. *American Philosophical Quarterly, 45*(1), 57-65.

Predelli, S. (2012a). Bare-boned demonstratives. *The Journal of Philosophical Logic, 41*, 547–562.

Predelli, S. (2012b). Indexicality, Intensionality, and Relativist Post-Semantics. *Synthese, 184*(2), 121-136.

Predelli, S. (2013). *Meaning without truth*. Oxford: Oxford University Press.

Predelli, S. (2014). Kaplan's three monsters. *Analysis, 74*(3), 389-393.

Predelli, S. (2015). Russell-names: an introduction to Millian descriptivism. *Journal of Philosophical Logic, 45*(5), 603-622.

Predelli, S. (2019). Four *Dthats*. Forthcoming in *Synthese*.

Predelli, S. & Stojanovic, I. (2008). Relativism and the Logic of Indexicals. In M. Kölbel & M. García-Carpintero (Eds.), *Relative Truth* (pp. 63-79). Oxford: Oxford University Press.

Prior, A. (1968). Now. *Nous, 2*, 101–119.

Prosser, S. (2012). Sources of Immunity to Error through Misidentification. In S. Prosser & F. Recanati (Eds.), *Immunity to Error through Misidentification* (pp. 158-179). Cambridge: Cambridge University Press.

Quer, J. (2001). Interpreting mood. *Probus, 13*(1), 81-111.

Quine, W.V.O. (1960). *Word and Object*. Cambridge (Massachusetts): MIT Press.

Quine, W.V. O. (1968). Ontological relativity. *Journal of Philosophy, 65*, 185–212.

Rabern B. (2012a). Against the identification of assertoric content with compositional value. *Synthese*, *189*, 75-96.

Rabern, B. (2012b). Propositions and multiple indexing. *Thought: a journal of philosophy*, *1*(2), 116-124.

Rabern, B. (2013). Monsters in Kaplan's LD. *Philosophical Studies*, *164*, 393-404.

Rabern, B. (2014). On being a monster. Unpublished Ms.

Rabern, B. (forthcoming). Semantic monsters. In H. Geirsson & S. Biggs (Eds.), *The Routledge Handbook of Linguistic Reference*. Routledge.

Rabern, B., & Ball, D. (2019). Monsters and the theoretical role of context. *Philosophy and Phenomenological Research*, *XCVIII*(2), 392-416.

Real Academia Española (2009). *Nueva Gramática de la Lengua Española*. Madrid: Espasa.

Recanati, F. (1993). *Direct reference: From language to thought*. Oxford: Blackwell.

Reinhart, T. (1997). Quantifier scope: How labor is divided between QR and choice functions. *Linguistics and Philosophy, 20,* 335–397.

Richard, M. (1982). Tense, proposition and truth. *Philosophical Studies 41*(3), 337-351.

Richard, M. (1993). Articulated terms. *Philosophical Perspectives*, *7*, 207-230.

Roberts, C. (2002). Demonstratives as definites. In K. van Deemter & R. Kibble (Eds.), *Information Sharing: Reference and Presupposition in Language Generation and Interpretation* (pp. 89-196). Stanford: CSLI Press.

Roberts, C. (2003). Uniqueness and definite noun phrases. *Linguistics and Philosophy*, *26*(3),

287–350.

Romdenh-Romluc, K. (2002). Now the French are invading England! *Analysis*, *62*, 34–41.

Romdenh-Romluc, K. (2006). I. *Philosophical studies*, *128*, 257-283.

Ross, J. R. (1967). Constraints on variables in syntax. Ph.D. dissertation, Massachusetts Institute of Technology.

Russell, B. (1905). On Denoting. *Mind*, *14*, 479-493.

Russell, B. (1911). Knowledge by Acquaintance and Knowledge by Description. *Proceedings of the Aristotelian Society*, *11*, 108-128.

Russell, B. (1918). *The Philosophy of Logical Atomism*. London: Routledge, 2010.

Russell, B. (1948). *Human Knowledge: Its Scope and Limits*. London: Routledge, 2009.

Sag, I. A., Wasow, T. & Bender, E. M. (2003). *Syntactic theory: a formal introduction*. Stanford: CSLI Publications.

Safir, K. (1984). Multiple variable binding. *Linguistic Inquiry*, *15*, 603-638.

Salmon, N. (1986). *Frege's puzzle*. Atascadero: Ridgeview.

Salmon, N. (1989). Tense and Singular Propositions. In J. Almog, J. Perry & H. Wettstein (Eds.), *Themes from Kaplan* (pp. 331-392). Oxford: Oxford University Press.

Salmon, N. (2002). Demonstrating and necessity. *The Philosophical Review, 111*(4), 497–537.

Salmon, N. (2006a). A theory of bondage. *Philosophical review*, *15*(4), 415-448.

Salmon, N. (2006b). Terms in bondage. *Philosophical Issues*, *16*, 263-274.

Salmon, N. (2008). That F. *Philosophical studies*, *141*(2), 263-280.

Santorio, P. (2012). Reference and monstrosity. *Philosophical Review*, *121*(3), 359-406.

Santorio, P. (2019). Context-free semantics. In E. Lepore & D. Sosa (Eds.), *Oxford Studies in Philosophy of Language, vol. 1* (pp. 208-239). New York: Oxford University Press.

Saul, J. (2012). *Lying, misleading, and what is said: an exploration in philosophy of language and in ethics*. Oxford: Oxford University Press.

Schaffer, J. (2012). Necessitarian propositions. *Synthese*, *189*(1), 119-162.

Schiffer, S. (1981). Indexicals and the theory of meaning. *Synthese*, *57*, 43–100.

Schlenker, P. (2003a). A plea for monsters. *Linguistics and Philosophy*, *26*(1), 29-120.

Schlenker, P. (2003b). Indexicality, logophoricity, and plural pronouns. In J. Lecarme (ed.), *Research in Afroasiatic Grammar II (Selected Papers from the Fifth Conference on Afroasiatic Languages, Paris, 2000)* (pp. 409-428). Amsterdam: John Benjamins.

Schlenker, P. (2005). The lazy Frenchman's approach to the subjunctive (speculations on reference to worlds and semantic defaults in the analysis of mood). *Proceedings of Going Romance XVII* (pp. 269-309).

Schlenker, P. (2006). Ontological symmetry in language: a brief manifesto. *Mind and Language*, *21*(4), 504-539.

Segerberg, K. (1973). Two-Dimensional Modal Logic. *Journal of Philosophical Logic*, *2*, 77–96.

Sharvy, R. (1969). Things. *The Monist*, *53*, 488-504.

Sidelle, A. (1991). The answering machine paradox. *Canadian Journal of Philosophy*, *21*, 525-39.

Soames, S. (2002a). *Beyond rigidity: The unfinished semantic agenda of naming and necessity*. New York: Oxford University Press.

Soames, S. (1987). Direct reference, propositional attitudes, and semantic content. *Philosophical Topics*, *15*(1), 47–87.

Stalnaker, R. (1968). A theory of conditionals. In N. Rescher (Ed.), *Studies in Logical Theory* (pp. 28-45). Oxford: Blackwell.

Stalnaker, R. (1972). Pragmatics. In D. Davidson & G. Harman (Eds.), *Semantics of Natural Language* (pp. 389–408). Reidel: Dordrecht.

Stalnaker, R. (1973). Presuppositions. *The Journal of Philosophical Logic*, *2*, 447–457.

Stalnaker, R. (1974). Pragmatic presuppositions. In M. Munitz & P. Unger (Eds.), *Semantics and Philosophy* (pp. 197-214). New York University Press.

Stalnaker, R. (1978). Assertion. In P. Cole (Ed.), *Syntax and Semantics 9: Pragmatics*. New York: Academic Press.

Stalnaker, R. (2014). *Context*. New York: Oxford University Press.

Stanley, J., & Szabó, Z. (2000). On quantifier domain restriction. *Mind & Language*, *15*(2 & 3), 219–61.

Stanley, J. (2002). Review of "Complex Demonstratives: A Quantificational Account". *The Philosophical Review*, *111*(4), 605-609.

Stanley, J. (2005). Knowledge and Practical Interests. Oxford: Oxford University Press.

Stokke, A. (2013). Lying, deceiving, and misleading. *Philosophy Compass*, *8*(4), 348-359.

Stowell, T. (1991). Small Clause Restructuring. In R. Freidin (Ed.), *Principles and Parameters in Comparative Grammar* (pp. 182-218). Cambridge (Massachusetts): MIT Press.

Strawson, P. F., (1950). On Referring. *Mind*, *59*, 320-344.

Sullivan, A. (2013). *Reference and structure in the philosophy of language*. Oxford: Clarendon Press.

Sun, C. (2006). *Chinese. A linguistic introduction*. New York: Cambridge University Press.

Swanson, E. (2005). Pronouns and complex demonstratives. Unpublished manuscript.

Taylor, B. (1980). Truth-theory for indexical languages. In M. Platts (Ed.), *Reference, truth, and reality* (pp. 182–183). London: Routledge.

Teixeira, L. R., & Basso, R. M. (2015). Definindo um operador-monstro. *ALFA: Revista de Linguística*, *59*(2).

Vicente, A. & Zeman, D. (2020). How to say 'when'. A Reichenbachian approach to the answering machine puzzle. In T. Ciecierski & P. Grabarczyk (Eds.), *The Architecture of Context and Context-Sensitivity. Perspectives from Philosophy, Linguistics and Logic* (pp. 98-112). Cham: Springer.

Vlach, F. (1973). *'Now' and 'Then': A Formal Study in the Logic of Tense Anaphora*. Ph.D. dissertation, University of California, Los Angeles.

von Fintel, K. (1994). *Restrictions on Quantifier Domains*. Ph.D. dissertation, University of Massachusetts, Amherst.

von Stechow, A. (2003). Feature deletion under semantic binding: Tense, person, and mood under verbal quantifiers. In M. Kadowaki and S. Kawahara (Eds.), *Proceedings of NELS 33* (pp. 397–403). Amherst: University of Massachusetts, Graduate Linguistic Student Association.

von Stechow, A. (2004). Binding by verbs: tense, person and mood under attitudes. In H Lohnstein & S. Trissler (Eds.), *The syntax and semantics of the left periphery* (pp. 431-488). Berlin: Mouton de Gruyter.

Wang, J. & Zheng, G. (1993). *An outline grammar of Mulao*. Canberra: The Australian National University.

Ward, G., Sproat, R. & McKoon, G. (1991). A pragmatic analysis of so-called anaphoric islands. *Language*, *67*, 439-473.

Westerståhl, D. (2012). Compositionality in Kaplan-style semantics. In W. Hinzen et al (Eds.), *The Oxford handbook of compositionality* (pp. 192-219). Oxford: Oxford University Press.

Whitehead, A. N. & Russell, B. (1927). *Principia Mathematica* (2nd edition). Cambridge: Cambridge University Press, 3 vols.

Winter, Y. (1997). Choice functions and the scopal semantics of indefinites. *Linguistics and Philosophy*, *20*, 399–467.

Wolter, L. (2006). That's that; the semantics and pragmatics of demonstrative noun phrases. Ph.D. thesis, University of California at Santa Cruz.

Yalcin, S. (2014). Semantics and metasemantics in the context of generative grammar. In A. Burgess & B. Sherman (Eds.), *Metasemantics: New Essays on the Foundations of Meaning* (pp. 17-54). New York: Oxford University Press.

Yalcin, S. (2018). Semantics as a Model-Based Science. In B. Rabern & D. Ball (Eds.), *The Science of Meaning. Essays on the Metatheory of Natural Language Semantics* (pp. 334-360). New York: Oxford University Press.

Yalcin, S. (2019). Parametric context-sensitivity I. Ms.

Zardini, E. (2014). Context and consequence. An intercontextual substructural logic. *Synthese, 191*(15), 3473-3500.