



Drivers' Opinion on the Driver Selection System and the Possible New Models in Spain

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Abstract: One of the objectives of the driver selection system in Spain is to determine if drivers have any psychophysical disorders that may impair their driving, in order to show the psychophysical aptitudes of people when obtaining or renewing a driving license. The general objective of this research was to understand drivers' opinions on the reliability and exhaustiveness of the actual selection of driver systems, as well as whether drivers agreed with the proposal of suspending the driving license after a medical check-up, if necessary. For this national study, it was used a total sample of $n=1200$ (666 [56%] men and 534 [44%] women) Spanish drivers, who answered a questionnaire designed to collect data about psychosocial characteristics and their perceptions about the driver selection system and their driving habits and conditions. More than half of the drivers considered that the process to assess their psychophysical aptitudes at the Centers for Selection of Drivers was *unreliable* or *very unreliable*. On the contrary, a high percentage of drivers considered that it was *appropriate* to temporarily suspend their driving license after a check-up, when it was necessary. It was concluded, in other words, that drivers have not enough confidence in the current driver selection system.

Keywords: Drivers, Driver Assessment, Driver Selection, Driver's Health, Driving Licensing, Road Safety

1. Introduction

Safe and competent driving is controlled and performed by our cognitive and social skills and capabilities, our ability to use strategies to face problems or conflicts, as well as by our attitudes and social values [1]. The correct performance of these skills requires having certain level of physical and mental health [2-4]. However, driving performance may be impaired by several health reasons, such as acute or chronic diseases, severe disorders, or sudden indisposition and temporary alterations [5, 6].

The manner in which drivers are evaluated to grant them driving licenses, and their rigor, are critical aspects that can substantially affect road safety results for the entire community [2]. In other words, poor evaluation of a driver who does not have the right psycho-physical conditions to operate a vehicle can facilitate the occurrence of a traffic accident, potentially causing serious injuries to the driver

and/or any other road user [4].

Keeping in mind the aforementioned, the general objective or purpose of this research was to understand the drivers' opinions on the reliability and exhaustiveness of the actual driver selection system to get or renew a driving license. Likewise, this research is meant to find whether drivers agree with the proposal of temporarily suspending the driving license after a check-up, if necessary.

Driver evaluation experiences

It has been stated in previous studies that the nature and evolution of the process of the disease will determine how our skills to drive safely are affected [7]. The annex 4 of the Spanish General Regulation of Drivers, approved by the Royal Decree 818/2009 [8], states the psychophysical aptitudes required to obtain or re-new a driving license. It also establishes the diseases and deficiencies that may cause for refusal, adaptations, or restrictions of some aspects of driving according to the Directive 2006/126/CE by both the European Parliament and the Council, from December 20th,

on the Driving License [9]. The assessment of the psychophysical aptitudes in Spain is carried out at the Centers for Selection of Drivers and it is regulated by the Royal Decree 170/2010 [10]. These psychophysical tests are aimed at checking the visual, auditory, musculoskeletal, circulatory, renal, respiratory, endocrine and nervous systems, and also at ruling out any hematological alterations, mental and behavior disorders, disorders related to the use and abuse of substances, and other non-specific causes [9, 10].

A previous study carried out in Spain [7] using a sample of 1500 drives showed that, in general terms, drivers considered their health condition to be good or very good, even though 67% of men and 32% of women showed chronic diseases. The most frequent health conditions were those related to the respiratory system (flu, colds, and bronchitis in 4.3% of the cases), the circulatory system (2.1%), the gastrointestinal tract (2.1%), and the musculoskeletal system and the connective tissue (2.1%) [7].

Another study carried out with 8000 Spanish drivers, who went to the Centers for Selection of Drivers, found that 77% of the drivers interviewed did not admit suffering from any chronic disease when renewing their driving license [11]. Another study on the same sample showed that 24.7% of the drivers interviewed usually used drugs; from these 8000 drivers, 65.8% of them were considered *fit* to drive, 27.3% were fit with limitations, 5.1% failed, and 0.4% did not pass the check-up. On the other hand, 6.8% of the drivers interviewed admitted they were using drugs and drinking alcohol every day, in other words, these statistics covers three of four potential alcohol-related problems [12].

Specifically, 60.3% of the drivers interviewed usually drank alcohol, whereas 2% were diagnosed with alcohol abuse or addiction disorder according to the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)* [13]. In general, 23.2% of drivers with some of these disorders were involved in a traffic accident, whereas 18.7% broke the traffic rules. Despite all of this, 72.2% of drivers with alcohol problems were healthy to drive [14].

Table 2. Frequency and percentage of drivers when they were asked whether they were in favor or against temporarily suspending the driving license.

	Very exhaustive		Exhaustive enough		Inexhaustive		Unreliable or very unreliable		Reliable enough or very reliable	
	n	%	n	%	n	%	n	%	n	%
In favor of temporarily suspending the driving license	33	73.3	429	81.7	551	87.5	425	81.3	588	86.9
Against temporarily suspending the driving license	12	26.7	96	18.3	79	12.5	98	18.7	89	13.1

2. Materials and Methods

2.1. Sample

The sample used was composed of 1200 Spanish drivers ranging from 18 to 64 years, 666 men (56%) and 534 women (44%); being very approximately representative to the percentage of gender distribution of the registered population.

The starting sample size was proportional by quota to the Spanish population segments of age and gender. The number of participants represents an error margin for the general data

Finally, a small percentage (0.3%) presented problems related to the use of illegal drugs (abuse or addiction). Those drivers were involved in a higher number of traffic accidents (33.3%) and traffic violations (79.2%) in the 12 months prior to the study [12, 14].

Table 1. Frequency and percentage of drivers when assessing the reliability of the process to assess psychophysical aptitudes.

	Unreliable or very unreliable		Reliable enough or very reliable	
	n	Percentage	n	Percentage
Very exhaustive	41	7.8	4	0.6
Exhaustive enough	403	77.1	122	18
Not exhaustive	79	15.1	551	81.4

As for those problems caused by chronic diseases, a recent study showed that 11.6% of 5234 drivers interviewed suffered from cardiovascular problems, whereas 1.4% had some neurological or neuromuscular disorder. Among those who were diagnosed with any cardiovascular disease, 82.5% were *fit* to drive, 15.9% could drive with limitations, whereas 1.6% did not pass the psychophysical tests [15]. Regarding the patients with neurological or neuromuscular disorders, the majority (77.1%) were healthy to drive, 21.6% were fit to drive with limitations, whereas only 1.3% were not healthy enough to drive [16].

A study carried out in the Canary Islands (Spain) in 2007 with a sample of 208 psychiatric outpatients showed that 84% of them did not pass at least one of the tests related to the necessary cognitive and psychomotor skills to obtain a driving license. In this sample, 79.5% of patients that drove almost every day obtained scores that were not enough to obtain or renew their driving license. On the other hand, none of the patients that participated in the study informed the traffic authorities about the fact that they suffered from a disease that could impair driving. These patients also did not stop driving even though 10% admitted they were not in good conditions to drive [17].

of ± 2.9 with a 95% confidence interval in the most unfavorable case of $p=q=50\%$.

2.2. Instruments

In order to get clear information regarding the objectives of the study, a structured-questionnaire was applied. This questionnaire consisted in a list of questions structured into different sections. First of all, the questionnaire was used to collect a series of socio-demographic data (e.g. age and gender) that allowed the possibility to classify drivers' profiles according to potential categorical and continuous variables useful to make statistical comparisons among the participating drivers.

Afterwards, participants answered a series of questions aimed at getting information about the reliability and exhaustiveness of the psychophysical tests in the actual driver selection system to get for first time or renew a driving license; participants also answered a series of questions aimed to establish whether they agree with the proposal of temporarily suspending the driving license after a check-up, if necessary, being this a current topic under discussion by the Spanish law.

2.3. Procedure

This national survey was conducted by telephone. Each household was screened to determine the number of adult (age 18 or older) drivers in the household. The only selection criteria were being in possession of any type of driving license for vehicles other than motorcycles and driving frequently. One eligible driver was systematically selected in each eligible household by the interviewers, using the computer-assisted telephone interviewing (CATI) system. The survey was carried out individually, guaranteeing at all times the anonymity of the participants, and stressing on the fact that the data would only be used for statistical and research purposes. The importance of answering honestly to all the arisen questions was emphasized, as well as the non-existence of correct or wrong answers.

2.4. Data Processing

Once the data was obtained, the relevant statistical analyses were performed using IBM SPSS (Statistical Package for Social Sciences), version 22.0.

2.5. Ethics

For this type of study, ethical approval and formal consent are not required. The research type described in the manuscript did not require the official intervention of the Ethics Committee in Experimental Research, (consultative and advisory body of the University of Valencia), as no personal data are used and the participation was anonymous.

3. Results

More than half of drivers (56.4%) stated that the current process to assess psychophysical aptitudes is unreliable or very unreliable (see Figure 1), and there were statistically significant tendencies according to the age group of participants ($\chi^2=23.901$, $p\leq 0.001$), such as drivers over 56, who perceive the lowest degrees of reliability on the current system.

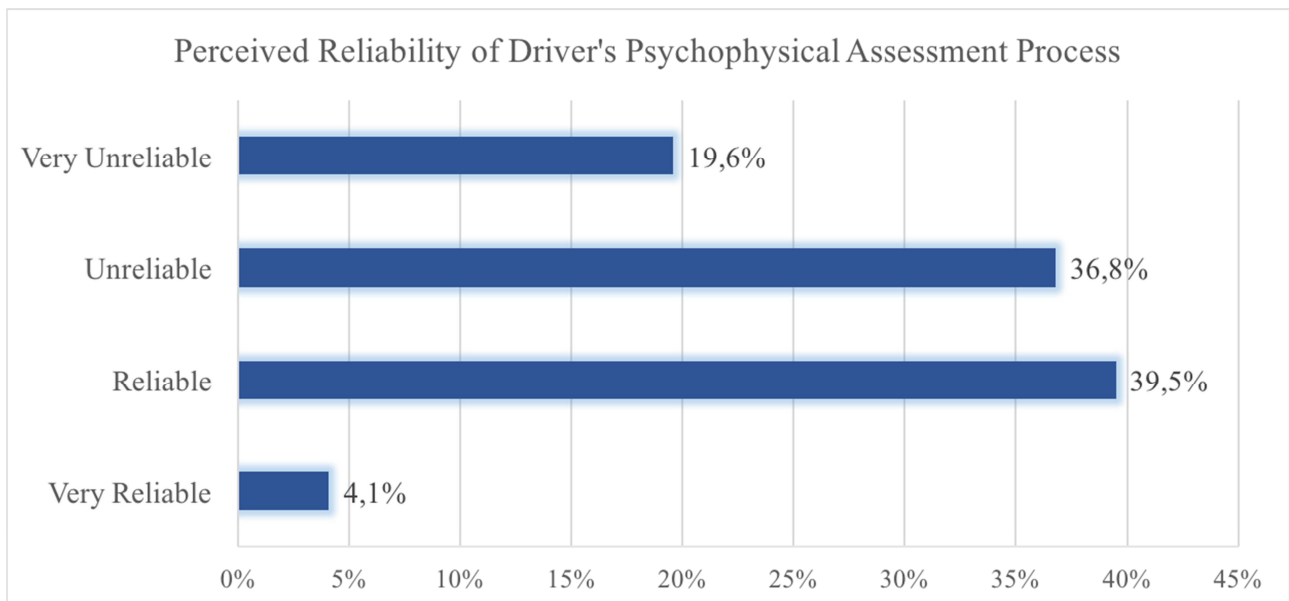


Figure 1. Percentage distribution of drivers according to their opinion on the reliability of the process to assess psychophysical aptitudes to drive.

On the other hand, 43.6% of the drivers interviewed considered that the process to assess psychophysical aptitudes in Spain in order to obtain or renew the driving license is reliable enough or reliable; however, there were no gender differences when participants assessed the reliability of this process.

Regarding the exhaustiveness of the current system, more than half of the drivers interviewed stated that the driver

selection system is inexhaustive (52.5%), 43.8% stated it is exhaustive enough, and only 3.8% of drivers considered it as exhaustive (Figure 2). There were also statistically significant trends for age groups ($\chi^2=34.207$, $p\leq 0.001$), so drivers aged 26 to 35 gave the current system the lowest grades and considered it is very inexhaustive; older drivers (aged 56 to 65) were the group of participants who most frequently considered the process as exhaustive enough or very exhaustive.

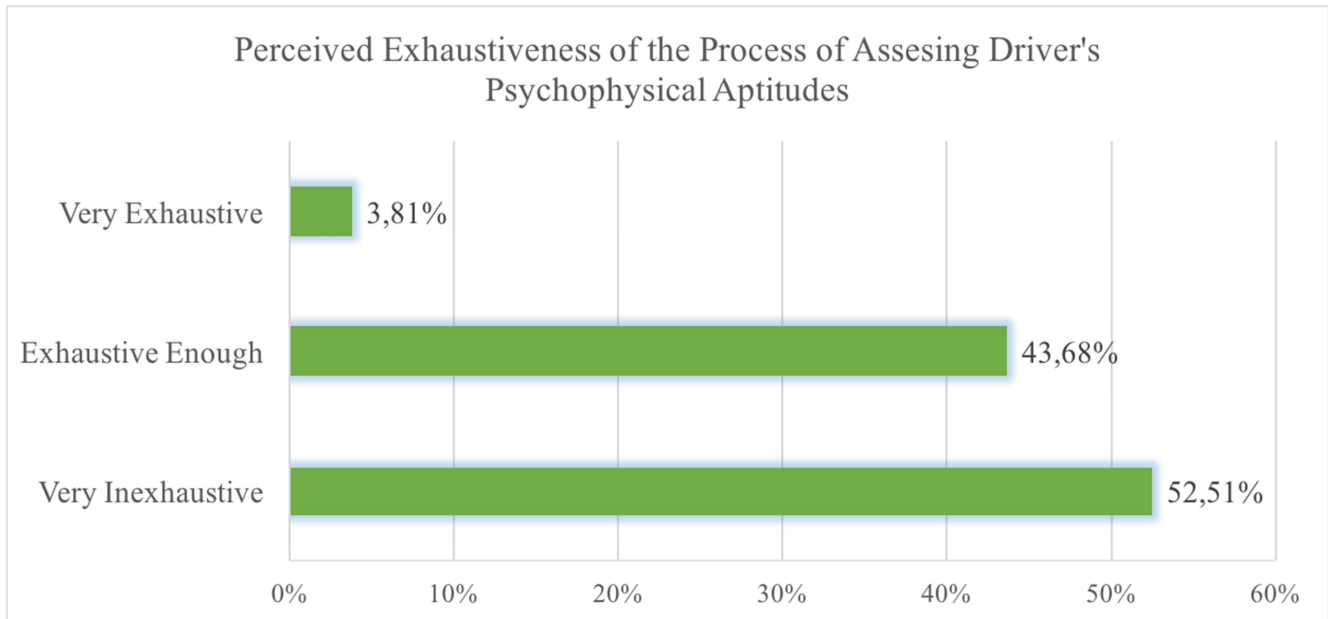


Figure 2. Percentage distribution of drivers according to their opinion on the exhaustiveness of the process to assess psychophysical aptitudes to drive.

It was not found any difference for gender when assessing the reliability or the exhaustiveness of the current driver selection system.

Regarding the relationship between these two variables, the drivers who gave lower results when assessing the reliability of the system also considered it to be more exhaustive or very exhaustive. Likewise, the opposite tendency was also observed; there was an important percentage of drivers who considered the process as very inexhaustive ($\chi^2=523.305$, $p\leq 0.001$), even though they considered it was reliable enough or very reliable.

When it came to suspending the driving license, 84.4% of drivers interviewed agreed to temporarily suspend it after a check-up, if necessary, whereas around 15.6% disagreed.

Finally, it were found significant tendencies when it came to temporarily suspending the driving license according to the level of exhaustiveness ($\chi^2=11.553$, $p\leq 0.01$) and the reliability ($\chi^2=7.013$, $p\leq 0.01$) attributed to the system for selection of drivers. This way, those drivers who considered the current system as reliable enough or very reliable and/or very inexhaustive were in favor of temporarily suspending the driving license after a check-up. On the contrary, those who considered the system as very exhaustive or exhaustive enough were not very much in favor of this preventive measure.

4. Discussion

From a multidimensional perspective, first of all, the concept "health" not only involves not being ill or suffering from a chronic, severe, or temporary disease, but being in a state of self-perceived biopsychosocial wellness that benefits the appropriate functioning of the biological, psychological, and social dimensions [18, 19]. Secondly, when people consider if they are in good conditions to drive or not, it not only depends on if they are suffering from a disease [5], but

on the risk and threat this disease means for the driver or other drivers [20-22]. Finally, it is important to take into account the need to regain drivers' confidence in the current system to assess psychophysical skills, therefore it is necessary to review and reformulate the system.

In order to do that, it is necessary to make more exhaustive tests [23], specifically including or regulating more physical (headaches, flu or allergic episodes, etc.) and mental disorders (stress, anxiety disorders, mood disorders, etc.) regardless of their severity or if they are chronic or not; as well as to insist on the fact that people cannot drive when they are using certain drugs that may impair driving [12].

4.1. Reliability of the Evaluation System

More than a half (56.4%) of Spanish drivers participating in this study perceives that the current process to assess psychophysical aptitudes of drivers during the licensing (or renewing driver licenses) is unreliable or very unreliable. It has to be taken into account that all these drivers have had a direct interaction with the current assessment method, at the time of being evaluated for the issuance or renewal of their driving license. Therefore, they have experienced first-hand an evaluation process that most of them find it unreliable and susceptible to admit as licensed driver people not able to adequately carry out this task, based on its psycho-physical conditions. In this sense, and as mentioned in other studies, a reliable system for assessing potential drivers should take into account a set of health conditions (e.g. objective –not only self-reported- health status, habits and risk factors), not all currently contained in the current system for driver's selection [11, 12].

4.2 Perceived Exhaustiveness on Driver Assessment

The observed fact that 52.5% of drivers consider that the driver's assessment in Spain is very inexhaustive, and only

3.8% of them states that the current system is highly exhaustive shows how ineffective the system is for its direct users. In other words, it represents a major conception of disarticulation and lack of rigor in the way in which it is determined whether a driver is (or is not) fit to perform the driving task.

In this sense, it is necessary to improve the diagnosis and detection of diseases that impair driving; this will only be achieved with the communication and collaboration between the centers for selection of drivers, primary care doctors, and health experts in the health care system [15]. In order to do that, health experts should get more involved in assessing the physical and psychological conditions of the patients, the comorbid diseases, as well as the drugs used to treat these diseases [14, 24]. These health experts should also take into account the vital and professional demands of the patients so that they minimize the possible side effects that may impair driving due to the use of prescription medicines. Lastly, the health experts should do a better job of informing patients about how these diseases may impair the cognitive and motor skills to drive and also about the possible side effects of these drugs thus emphasizing the serious consequences of self-medication [25]. Likewise, it is also necessary to tell patients that they should not drive when they are not in good conditions to develop this task accurately [26].

It is important to take into account the importance and responsibility of the primary care doctor's advice in order for the patient to use the vehicle in a responsible manner [23, 25, 27]. Moreover, it results also necessary to formulate and make health recommendations for those patients with stable mental disorders [25, 28], and to recommend and advice in writing that these drivers temporarily stop driving until they become stabilized, this way drivers are fully responsible of their actions [19]. This should help authorize the possibility to suspend the driving license for those drivers who may be a risk to others on the road. Finally, it is also necessary to inform the traffic authorities about those cases in which driving may be impaired by any disorder stated in this study [29]. Likewise, it would be advisable to establish an information protocol and an action plan for those periods when drivers cannot drive due to their treatment.

All of this shows the urgent need for the testing centers, primary care doctors, health experts, psychologists, and the Directorate General of Traffic (DGT) to collaborate and complement each other. In fact, traffic authority should make communication and information flow more efficient before giving or renewing a driving license. It would be advisable, as other countries do, that professionals who are able to carry out sensorimotor, cognitive, and performance assessments (specialists in rehabilitation and occupational therapists) get involved in the assessment of drivers [20, 29]. It is also important to raise the need of measuring critical variables for driving performance such as fatigue [30, 31], stress [32, 33, 34], general fitness of drivers [35, 36], driving attention [37, 38] and its perceptions related to how much do the mental and physical health may impair driving performance [39, 40]. In addition to the aforementioned preventive measures and

variables to keep in mind, it is also necessary to design and apply formal intervention strategies to inform and teach drivers about the different diseases that may impair driving through a strengthening of road safety education [41] both for drivers as for every road user [42, 43], essentially among the most vulnerable groups of population [44, 45].

4.3. Practical Implications

This work can contribute to the review and improvement of the criteria for driver's selection, based on the perception of the exhaustiveness that the drivers attribute to the current system of licensing. In brief, it is important to emphasize the lack of consistency and low perceived stringency in the testing of drivers perceived by them.

5. Conclusion

Taking into account that more than half of the drivers interviewed consider the process to obtain or renew a driving license as unreliable or very unreliable and inexhaustive, it can be said that the drivers interviewed showed lack of confidence in the current driver selection system. This lack of confidence of drivers in the licensing system may be due to the fact that drivers considered that the process is not very appropriate and rigorous from a practical point of view.

Limitations of the study

The central fact that the interview was carried out using telephone calls supposed that some people hang up before they started the questionnaire or when they did not want to answer some of the questions. For instance, it was interesting the fact that some men refused to answer when they were asked about their health conditions. However, the number of the total sample (1200) was the target number of participants to be included in this research since it is representative, so telephone calls were made until this target number was reached.

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