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"MY BEST SELF":

EFFICACY AND UNDERLYING MECHANISMS OF A POSITIVE PSYCHOLOGY INTERVENTION

TESIS DOCTORAL

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“

Ain't got no water, ain't got no love
Ain't got no air, ain't got no God
Ain't got no wine, ain't got no money
Ain't got no faith,

Then what have I got, why am I alive anyway?
What have I got, nobody can take away:

I got my hair, got my head
Got my brains, got my ears
Got my eyes, got my nose
Got my mouth,
I got my…
I got myself

”

Nina Simone.

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Introducción

Intervenciones Psicológicas Positivas y bienestar

Salvo por los ya clásicos modelos teóricos sobre el bienestar (p. ej. Diener, 1984; Ryff, 1989) y algunos trabajos pioneros dirigidos específicamente a desarrollar nuevas formas de incrementar la felicidad (p. ej. Fordyce, 1977), el interés científico sobre las facetas positivas de la vida no floreció hasta finales de los años 90, con la llegada oficial del movimiento de la Psicología Positiva (Seligman & Csikszentmihalyi, 2000). A partir de ese momento, la atención por parte del colectivo científico sobre cómo explicar y fomentar el bienestar de las personas ha ido en aumento. Existe una extensa evidencia sobre la importancia y los beneficios de promover las emociones positivas y el bienestar, e incluso la Organización Mundial de la Salud las incluyó en su descripción de la salud mental, definida como la presencia de un estado de pleno bienestar físico, mental y social, y no simplemente la mera ausencia de enfermedad mental (WHO, 2001). En otras palabras, para lograr la salud mental no basta con trabajar únicamente en el alivio de los síntomas, sino que también es importante trabajar activamente en la promoción del bienestar y, por lo tanto, investigar nuevos enfoques que ayuden a mejorarlo.

Además, tal y como afirma la teoría de "ampliación y construcción" (Fredrickson, 2001), la promoción de las emociones positivas no sólo es un propósito valioso en sí mismo, sino también un medio para un funcionamiento óptimo a largo plazo. Contrariamente a los efectos producidos por las emociones negativas, que constriñen las cogniciones y fomentan unos repertorios específicos de acción para ayudar al individuo a manejar una situación adversa, las emociones positivas amplían los modos habituales de pensar o actuar de un individuo (por ejemplo, la alegría amplía la creatividad, y el interés promueve la exploración y la búsqueda de nueva información), lo que a su vez puede ayudar a construir recursos personales a largo plazo como, por ejemplo, una mayor resiliencia (Fredrickson, 2001).

En respuesta al aumento contemporáneo en el interés por el bienestar, las Intervenciones Psicológicas Positivas (IPP) surgieron como recursos prometedores que podrían ayudar a las personas a florecer, y cuyo objetivo es aumentar el bienestar de las personas cultivando sentimientos, cogniciones o conductas positivas (Bolier y cols., 2013; Mitchell, Vella-Brodrick, y Klein, 2010; Sin y Lyubomirsky, 2009). Por su definición, se puede inferir que las intervenciones dirigidas principalmente a disminuir el sufrimiento de los pacientes o a reducir la psicopatología no se considerarían IPP: el factor clave de este tipo de intervenciones es el enfoque específico en cultivar directamente el funcionamiento positivo y el bienestar, en lugar de centrarse en el alivio de la sintomatología.

Bajo el paraguas de las IPP, se han desarrollado numerosos estudios para desarrollar y probar la eficacia de diferentes IPP, que habitualmente son fáciles de implementar y que no requieren un entrenamiento o unas habilidades específicas por parte de los participantes. Aunque todas las IPP comparten el mismo objetivo (promover el bienestar), los medios utilizados para lograr este objetivo son muy heterogéneos. Se han llevado a cabo numerosos y diversos estudios en los que se ha evaluado la eficacia de las diferentes IPP, mostrando aumentos en los niveles de bienestar en comparación con las condiciones control (Bolier y cols., 2013; Sin y Lyubomirsky, 2009).

Es posible organizar las IPP con respecto al marco temporal en el que se centran, siendo categorizadas como IPP asociadas al pasado (por ejemplo, escribir sobre experiencias pasadas positivas o escribir cartas de agradecimiento apreciando algo positivo que alguien hizo por nosotros/as en el pasado), al presente (por ejemplo, la realización de actos diarios de amabilidad, o saborear los eventos positivos a medida que ocurren), o al futuro (imaginar acontecimientos positivos que podrían ocurrir en un futuro próximo o imaginarse a uno/a mismo/a en el mejor futuro posible, una vez logrado todo lo que se deseaba) (Alden y Trew, 2013; Baikie, Geerligs, y Wilhelm, 2012; Boehm, Lyubomirsky, y Sheldon, 2011; Burton y King, 2004; Hurley y Kwon, 2012; King,

2001; O'Connell, O'Shea, y Gallagher, 2016; Quoidbach, Wood, y Hansenne, 2009; Seligman, Steen, Park, y Peterson, 2005; Smith, Harrison, Kurtz, y Bryant, 2014). Además, existen programas que combinan diferentes intervenciones, en los que no sólo se utiliza un único ejercicio específico, sino una combinación de IPP que puede ser muy heterogénea (p. ej. Flink, Smeets, Bergbom, y Peters, 2015; Manicavasagar y cols., 2014; Page y Vella-Brodrick, 2013).

Hasta la fecha, se han realizado dos metaanálisis sobre la eficacia de las IPP en la mejora del bienestar (Bolier y cols., 2013; Sin y Lyubomirsky, 2009), que han mostrado que las IPP son intervenciones eficaces para aumentar el bienestar. Sin embargo, los resultados derivados de los mismos incluyeron una amplia gama de IPP tan diversas como actividades destinadas a promover la gratitud, el optimismo o la bondad, la psicoterapia positiva o la terapia de atención plena (*mindfulness*), así como diversos programas integrales de IPP, por lo que sus resultados no pueden atribuirse a intervenciones específicas, sino a las IPP en su conjunto. Por esta razón, aún es necesario llevar a cabo metaanálisis de IPP específicas para complementar estos resultados (Bolier y cols., 2013).

¿Por qué funcionan las IPP?

Teniendo en cuenta la evidencia existente sobre las IPP, se puede concluir que estas intervenciones son medios valiosos para la promoción del bienestar. Sin embargo, como consecuencia de la progresión en el conocimiento de estas intervenciones y después de casi dos décadas desde la llegada del movimiento de la Psicología Positiva, una nueva pregunta ha surgido: ¿por qué funcionan las IPP? En otras palabras, ¿cuáles son los mecanismos que las hacen eficaces? Aunque esta pregunta sigue sin respuesta, se han desarrollado algunos modelos para avanzar en la materia.

Por un lado, Quoidbach, Mikolajczak y Gross (2015) propusieron un marco para integrar los hallazgos de las IPP dentro del modelo de regulación emocional

(Gross, 1998), que hace referencia al proceso en el que el individuo influye activamente en sus emociones. En este marco, los esfuerzos para aumentar las emociones positivas se organizan según los procesos psicológicos que tienen lugar y el marco temporal en el que se utilizan. Estos procesos son las estrategias utilizadas por los individuos para regular sus emociones positivas (por ejemplo, seleccionar una situación en función de las consecuencias emocionales que se esperan, prestar atención al lado positivo de la experiencia, replantear el significado de la situación, etcétera), y se organizan dentro de un marco temporal, dependiendo del momento en que se despliegan, ya sea antes, durante, o después del evento, mediante la anticipación, experiencia y recuerdo, respectivamente. Siguiendo la lógica del modelo, las IPP pueden organizarse en función de las estrategias que se activan al practicarlas y del momento en que se producen con respecto a la situación específica. Por ejemplo, la IPP “saborear el momento” se categorizaría como una focalización de la atención durante el evento (a través de la experiencia).

Por otro lado, las teorías del “ajuste persona-actividad” desplazan el foco de atención de las intervenciones en sí mismas hacia la interacción entre éstas y las características de los individuos que las practican (Lyubomirsky y Layous, 2013; Schueller, 2014). Estas teorías asumen que las diferentes IPP serán más beneficiosas para unos individuos que para otros, según las características de ambos. Concretamente, enfatizan la importancia que tiene el "ajuste" entre ambos (persona y actividad) en los efectos sobre el bienestar obtenidos por las IPP. Lyubomirsky y Layous (2013) combinaron este marco teórico y la evidencia existente de estudios previos para desarrollar el “modelo de las actividades positivas”, en el que propusieron varias características de los individuos que probablemente promoverían el bienestar duradero si se combinasen con algunas características de la propia actividad positiva.

Ejemplos de las características de los usuarios de las IPP son la motivación para participar en la actividad, su esfuerzo por realizarla, sus rasgos de personalidad, el apoyo social, las características demográficas y el nivel

afectivo previo al inicio de la actividad. En cuanto a las características de las intervenciones, el modelo propone dos tipos: las que se pueden aplicar a cualquier IPP, y las que diferencian una IPP de otra. Las primeras son la dosis prescrita (por ejemplo, practicar la actividad una vez a la semana o una vez al día), la variedad (practicar sólo un tipo de intervención o una combinación), la secuencia de la práctica (p. ej. cuál es la actividad inicial en un paquete integral de IPP) y el apoyo social recibido para la práctica. En cuanto a las características que permiten diferenciar entre las IPP, se han propuesto la orientación social de la actividad (es decir, si están orientadas a otras personas como realizar actos de bondad, o hacia uno/a mismo/a como practicar el pensamiento optimista), la naturaleza cognitivo-conductual de la actividad (es decir, si la actividad propuesta es social-conductual como ser amable o reflexiva-cognitiva como saborear el momento), y el foco temporal específico (por ejemplo, actividades centradas en el pasado como intervenciones de gratitud, en el presente como saborear el momento o en el futuro como visualizarse a sí mismo/a en el mejor futuro posible).

El interés de la investigación sobre estas características va en aumento y, en este sentido, los estudios empíricos que incluyen variables personales como posibles moderadores de la eficacia de las diferentes IPP están creciendo exponencialmente (p. ej. Antoine, Dauvier, Andreotti, y Congard, 2018; Harbaugh y Vasey, 2014; Lyubomirsky y Layous, 2013; Proyer, Gander, Wellenzohn, y Ruch, 2016a; Seear y Vella-Brodrick, 2013).

Por otra parte, en cuanto a las características de las IPP que se diferencian entre sí, sólo se han publicado unos pocos estudios. Un ejemplo es el trabajo de Wellenzohn y su equipo (Wellenzohn, Proyer, y Ruch, 2016), que consideraron la temporalidad de las IPP como un factor clave para su eficacia. Manipularon la temporalidad de una IPP basada en el humor y encontraron beneficios similares en las distintas versiones de a intervención (pasada, presente o futura), aunque los mecanismos subyacentes a su eficacia eran diferentes. Otro estudio relevante es el de Mongrain y Anselmo-Matthews (2012). En este

estudio, se manipuló explícitamente una condición de control para que se asemejara a otras IPP previamente validadas (Seligman y cols., 2005), y no se encontraron diferencias entre esta condición control y las IPP. Tras estos resultados, propusieron que uno de los principales elementos de las IPP que podía estar produciendo beneficios era la activación de información positiva relevante para uno/a mismo/a.

Los modelos mencionados y los estudios empíricos relacionados a estos destacan la influencia que algunas variables pueden tener sobre la eficacia de las IPP general, las cuales pueden utilizarse para fomentar su eficacia y sacar el máximo provecho de las mismas. Sea como fuere, la investigación sobre por qué y cómo funcionan las actividades positivas se encuentra todavía en sus primeras etapas y necesita ser explorada más a fondo, por lo que la pregunta sobre por qué funcionan las IPP sigue sin tener una respuesta clara (Bolier y cols., 2013; Lyubomirsky y Layous, 2013; Mongrain y Anselmo-Matthews, 2012; Wang y cols., 2017). Además, estos primeros estudios y modelos se han aplicado principalmente a toda la gama de las IPP en general y se han centrado principalmente en los factores moderadores de los individuos, por lo que no explican cuáles son los mecanismos precisos que subyacen y explican por qué y cómo funciona cada IPP específicamente. Por lo tanto, es necesario continuar la investigación sobre los factores que hacen que cada IPP sea individualmente eficaz.

IPP y las Tecnologías de la Información y de la Comunicación

La Psicología Positiva se ha desarrollado junto con el crecimiento de la era digital y ambos avances no han sido independientes: incluso desde su creación, la Psicología Positiva ha estado relacionada con el campo de las Tecnologías de la Información y la Comunicación (TIC) (Seligman y cols., 2005). En 2018, los/as usuarios/as de Internet han llegado hasta el 54,4% de la población mundial, siendo la tasa especialmente elevada en Europa (85,2%) y

América del Norte (95%; Internet World Stats, 2018). En la misma línea, alrededor del 59% de la población mundial informó que poseía un *smartphone* en 2017 (Pew Global, 2018). Estas estadísticas confirman la gran presencia que las tecnologías tienen en nuestra vida cotidiana, cuyo avance no sólo afecta a las rutinas cotidianas de cada persona, sino que también ha influido en las intervenciones que los/as profesionales de la psicología y la investigación están desarrollando.

Esta asociación llevó al desarrollo de las Intervenciones de Psicología Positiva diseminadas a través de Internet (IPPI), que tienen múltiples ventajas: mayor accesibilidad (Internet está disponible en cualquier momento y desde muchos lugares), coste-efectividad (por ejemplo, ahorra tiempo a los/as profesionales de la salud mental), personalización (los contenidos se pueden personalizar dependiendo del perfil de los/as usuarios/as o de sus respuestas), opciones multimedia (por ejemplo, vídeos e imágenes pueden enriquecer o sustituir a los textos), empoderamiento de los/as consumidores/as (ya que asumen un papel activo en su participación y pueden dirigir su propio proceso de aprendizaje), y anonimato, entre otras (Mitchell y cols., 2010). Además, en los últimos años, y como una consecuencia de la rápida revolución en el campo de los *smartphones*, muchas de estas IPPI son ahora diseminadas a través de estos dispositivos en forma de aplicaciones específicas para teléfonos inteligentes (*apps*). Su aplicación a través de teléfonos móviles tiene, además de las ventajas propias de las IPPI, potencialidades como la implicación de diferentes sensores, envío de mensajes y recordatorios, llamadas, fotografías y mucho más. En consecuencia, pueden ser herramientas extremadamente útiles para realizar intervenciones de forma natural como parte de la rutina de los/as participantes, dada su elevada ubicuidad y los recursos innovadores que ofrecen, lo que hace que la intervención sea más flexible y atractiva.

Todas estas ventajas ya están siendo utilizadas por los/as profesionales para diseñar y desarrollar intervenciones aún más accesibles. Ya existen numerosos estudios sobre IPPI, incluyendo también las diseminadas en forma de *apps* que

demuestran que es factible diseminar IPP a través de las tecnologías, por lo que sus beneficios pueden ser maximizados (Daugherty y cols., 2018; Drozd, Mork, Nielsen, Raeder, y Bjørkli, 2014; Proyer, Gander, Wellenzohn, y Ruch, 2016b; Sergeant y Mongrain, 2015),

En conclusión, las TIC constituyen un recurso que ya ha producido resultados prometedores en el ámbito de la Psicología Positiva. Esta alianza entre las TIC y la Psicología Positiva puede producir grandes avances en la promoción del bienestar de los individuos: las TIC tienen la capacidad de llegar a personas en todo el mundo y de proporcionar recursos adaptados a las poblaciones diana, lo que sería imposible para las IPP sin estos valiosos medios.

El caso de la intervención “Mi Mejor Yo Posible”

La intervención del Mejor Yo Posible (MYP) es una de las IPP más utilizadas, con más de 30 estudios publicados sobre su eficacia (Loveday, Lovell, y Jones, 2016). Al practicar esta actividad, se les pide a los participantes que escriban sobre sí mismos/as en el mejor futuro posible, después de haber obtenido todo lo que deseaban. Esta actividad tiene como objetivo promover una perspectiva positiva de uno/a mismo/a en el futuro, y promueve la generación de esta imagen mental a través de una pequeña redacción.

Este ejercicio fue desarrollado por King (2001) como un primer intento de comparar paradigmas de escritura positivos y negativos, evaluando los efectos de este ejercicio y los obtenidos al escribir sobre un evento traumático, que había demostrado previamente ser beneficioso para la salud como consecuencia de procesos de expresión y desahogo emocional (Pennebaker, 1997). El estudio de King pretendía responder a la siguiente pregunta: ¿es necesario escribir sobre un evento traumático para producir beneficios en la salud, o es posible obtenerlos a través de la escritura sobre temas menos angustiantes? Basándose en hallazgos anteriores, la autora planteó la hipótesis de que cualquier tema autorregulatorio podría producir beneficios de salud

similares a los de la escritura sobre trauma, fuera o no negativo. El estudio incluyó participantes que escribieron sobre su MYP, el evento más traumático que habían vivido, o las actividades que harían al día siguiente (tema neutral). Fueron aleatorizados/as a una de estas condiciones, y escribieron sobre el tema asignado durante 20 minutos a lo largo de cuatro días. Los resultados mostraron que tanto la escritura sobre trauma como sobre el MYP fueron beneficiosos para la salud física, y que el MYP mostró aumentos significativos en el bienestar. Además, los participantes en la condición del MYP calificaron el ejercicio como significativamente menos angustiante que los participantes en la condición de escritura sobre trauma.

Desde el año 2001 hasta ahora se han publicado numerosos estudios para evaluar la eficacia de esta intervención con diferentes medidas de bienestar. Algún otro estudio comparó la eficacia de la escritura sobre el MYP y sobre el trauma (Austenfeld, Paolo, y Stanton, 2006; Austenfeld y Stanton, 2008; Yogo y Fujihara, 2008), pero desde el surgimiento del movimiento de la Psicología Positiva, el interés en los beneficios del ejercicio MYP emigró gradualmente hacia la promoción del bienestar y, como resultado, el interés en el paradigma de la escritura sobre trauma y el alivio de los síntomas disminuyó. Actualmente, los grupos de comparación son generalmente grupos en los que los/as participantes escriben sobre temas neutrales (por ejemplo, las actividades realizadas durante las últimas 24 horas).

El ejercicio MYP ha sido utilizado en diversos contextos y con diferentes objetivos específicos. La mayoría de los estudios utilizaron la intervención como una forma de promover el bienestar de los participantes, aplicándola a través de Internet (Layous y cols., 2013; Lyubomirsky, Dickerhoof, Boehm, y Sheldon, 2011), mientras que otros la aplicaron en persona, ya sea individualmente (Enrique, Bretón-López, Molinari, Baños, y Botella, 2017; Ng, 2016), o en pequeños grupos (Sheldon y Lyubomirsky, 2006).

Generalmente, los estudios han encontrado que el MYP, comparado con las condiciones control, produce aumentos significativos en el afecto positivo y

disminuciones en el afecto negativo (Harrist, Carlozzi, McGovern, y Harrist, 2007; Meevissen, Peters, y Alberts, 2011), e incrementos en los niveles de satisfacción con la vida (Boehm y cols., 2011; Liau, Neihart, Teo, y Lo, 2016), felicidad (Ng, 2016), bienestar (Odou y Vella-Brodrick, 2013) y optimismo (Boselie, Vancleef, y Peters, 2017; Hanssen, Peters, Vlaeyen, Meevissen, y Vancleef, 2013).

Como puede observarse, el ejercicio MYP es una IPP compleja que requiere que los/as participantes escriban y se imaginen a sí mismos/as bajo una perspectiva positiva, y que ha experimentado un crecimiento exponencial desde su inicio. A lo largo de los diferentes estudios publicados, es posible observar que el MYP parece una intervención eficaz para mejorar el bienestar. Sin embargo, esta conclusión sólo puede derivarse del análisis de los estudios individuales, ya que sólo existe una revisión cualitativa de esta intervención, que no incluye ningún análisis de eficacia (Loveday y cols., 2016). Además, la misma pregunta que concierne a otras IPP también rodea a esta intervención: se desconoce qué características hacen que esta intervención sea eficaz y si existen factores específicos que puedan estar a la base de su eficacia. Por lo tanto, es necesario seguir explorando la eficacia global de esta intervención y sus características idiosincrásicas.

Objetivos

Tal como se ha mencionado anteriormente, las IPP pueden ser recursos valiosos para promover el bienestar en los individuos, y en este contexto, el ejercicio MYP parece ser un enfoque prometedor. Sin embargo, aunque existen muchos estudios individuales publicados acerca de su eficacia, todavía se desconoce cuál es la eficacia global de esta intervención. Además, la investigación sobre los mecanismos que subyacen a su eficacia es escasa. En este sentido, la temporalidad se ha planteado como un factor relevante que vale la pena seguir explorando, ya que incluso los modelos teóricos desarrollados para arrojar luz

sobre el funcionamiento de las IPP coinciden en la importancia que la temporalidad puede tener para desentrañar cómo funcionan estas intervenciones. Sin embargo, no está claro qué papel desempeña el marco temporal en la intervención MYP, que por definición se clasifica en una IPP de orientación futura.

Por lo tanto, el objetivo de esta tesis es doble: explorar la eficacia global del MYP y analizar el papel de los mecanismos que pueden influir en su eficacia. Concretamente, se examinará el papel del foco temporal.

Específicamente, esta tesis tiene los siguientes objetivos:

1) Revisar la eficacia general de la intervención MYP en base a la evidencia existente.

2) Contribuir a una medición más precisa del bienestar considerando el marco temporal.

3) Diseñar y desarrollar dos variantes temporales del MYP que serán aplicadas a través de TIC.

4) Analizar la eficacia de las tres versiones temporales del MYP, aplicadas a través de las TIC, para aumentar el bienestar.

5) Analizar los posibles mecanismos subyacentes a su eficacia, mediante análisis cualitativos de los textos.

Metodología y resultados

Para alcanzar los objetivos planteados, se realizaron 5 estudios organizados en 4 Capítulos.

El Capítulo 2 tiene como objetivo el análisis de la eficacia general de la intervención MYP en base a la evidencia existente, y consiste en una revisión sistemática y metaanálisis sobre la eficacia de la intervención en la mejora del bienestar.

El objetivo del Capítulo 3 es contribuir a una evaluación más precisa de uno de los componentes del bienestar, la satisfacción con la vida, teniendo en cuenta el marco temporal. En concreto, este Capítulo describe la validación española de una escala que mide la satisfacción de la vida temporal, y que se utilizará posteriormente en estudios contenidos en el Capítulo 4. En este estudio, además, se explora la relación entre este constructo con variables sociodemográficas y con el afecto positivo y negativo.

El Capítulo 4 trata del diseño y desarrollo de dos variantes temporales del MYP (Mejor Yo Pasado, y Mejor Yo Presente) aplicadas a través de TIC, y del análisis de su eficacia en el aumento de los niveles de bienestar. En concreto, incluye dos ensayos controlados aleatorizados (Estudio 1 y Estudio 2), en los que se describen las dos variantes temporales del ejercicio MYP desarrolladas, y que analizan la eficacia de las tres versiones del MYP en comparación con una condición control.

El Capítulo 5 tiene como objetivo ahondar en la investigación sobre la eficacia del MYP, y en concreto, se centra en analizar los posibles mecanismos subyacentes a su eficacia. Incluye un diseño mixto en el que se combina un análisis cualitativo de los textos incluidos en el Estudio 1 con datos cuantitativos sobre la eficacia de la intervención para mejorar el afecto positivo.

Capítulo 2. Eficacia del ejercicio Mejor Yo Posible: una revisión sistemática y metaanálisis

En este Capítulo se presenta un metaanálisis y una revisión sistemática de la intervención del MYP. Hasta la fecha, y tras casi 20 años desde el primer estudio realizado sobre esta intervención (King, 2001), para analizar la eficacia de este ejercicio, había que revisar los resultados de los diferentes estudios individuales, independientemente de sus características específicas, ya que los metaanálisis existentes (Bolier y cols., 2013; Malouff y Schutte, 2016; Sin y Lyubomirsky, 2009) incluían algunos de los estudios publicados sobre MYP, pero incluían muchas otras intervenciones no relacionadas con éste. Hasta donde sabemos, este es el primer metaanálisis que analiza la eficacia de esta intervención.

La selección de estudios incluidos en el metaanálisis se llevó a cabo por parte de dos revisoras independientes, con los siguientes criterios de inclusión: ser un estudio empírico sobre la eficacia del MYP, incluir medidas relacionadas con el bienestar o la depresión, incluir un mínimo de dos grupos (MYP y grupo control), proporcionar suficientes datos estadísticos para el cálculo del tamaño del efecto (TE), y estar escrito en inglés o español. Se realizó una búsqueda sistemática que produjo, finalmente, 28 estudios incluidos en los análisis (algunos de los cuáles incluían un grupo adicional que practicó un ejercicio de gratitud) con una muestra total de 2.863 participantes (1.247 en grupos MYP, 1.155 en grupos de control y 461 en grupos de gratitud).

Las medidas de resultado utilizadas fueron: bienestar, optimismo, afecto positivo y negativo y depresión, y el tamaño del efecto utilizado fue la diferencia media estandarizada entre el cambio producido por la condición MYP y el cambio producido por el grupo control. Se analizaron por separado los resultados obtenidos por intervenciones MYP breves (una sola sesión) y por intervenciones MYP más largas (más de un día de práctica).

Además, se recogieron 15 variables moderadoras potenciales relativas a la muestra, el método de implementación de la intervención (por ejemplo, a través de Internet), las características de la intervención en sí misma (por ejemplo, el total de días de duración) y la calidad de los estudios.

Se realizaron metaanálisis separados para cada una de las cinco medidas de resultado, Análisis de Varianzas (ANOVAs) y meta-regresiones para analizar el papel de las variables moderadoras y se analizó también la presencia de riesgo de publicación.

Los resultados mostraron que el MYP puede considerarse una intervención efectiva para aumentar los niveles de bienestar en comparación con los controles, tanto como sesión breve como intervención más larga. Concretamente, la intervención mostró ser eficaz para aumentar los niveles de bienestar (d_+ = .291 y d_+ = .381), optimismo (d_+ = .378, y d_+ = .278), y afecto positivo (d_+ = .339 y d_+ = .657), y como intervención larga para disminuir los síntomas depresivos (d_+ = .115) y el afecto negativo (d_+ = .411). Considerando la magnitud de los tamaños del efecto obtenidos, parece que la MYP muestra efectos más fuertes como una intervención más corta (es decir, de menor duración) excepto en el caso del afecto negativo, que muestra un patrón invertido.

Los análisis de moderadores no arrojaron resultados significativos, salvo por una tendencia hacia la significación en el caso de la edad de la muestra (años y desviación estándar) y la magnitud de la intervención (cantidad total de minutos de práctica), que podría indicar que el MYP podría ser más eficaz para los participantes mayores y en muestras más diversificadas en cuanto a edad, y con una práctica más corta (menos minutos en total). Sin embargo, debido a la falta de significación estadística, estos resultados deben tomarse con precaución.

Dado que algunos estudios también incluyeron un grupo adicional que practicaba un ejercicio de gratitud, fue posible realizar un metaanálisis para

comparar los efectos del MYP y los de la intervención en gratitud (aunque con un número sustancialmente reducido de estudios), que demostró la superioridad del MYP en la mejora del afecto positivo y la disminución del afecto negativo.

En resumen, este estudio contribuye al conocimiento de la eficacia de la intervención del MYP, y es el primer enfoque cuantitativo realizado en estudiar su eficacia global. Los resultados indican que el MYP es una actividad positiva que puede ser utilizada para aumentar el bienestar de quienes la practican. Cabe señalar, sin embargo, que los análisis de los moderadores no mostraron evidencia sobre qué factores o mecanismos estaban involucrados en su eficacia (excepto por la mencionada tendencia a la significación en algunas variables), lo que abre la puerta a futuras investigaciones destinadas a desentrañar esta cuestión. No obstante, estos resultados permiten recomendar esta actividad como un recurso relevante para los/as profesionales de la salud mental.

Capítulo 3. La satisfacción con la vida pasada, presente y futura y el papel de la edad, y el afecto positivo y negativo

El Capítulo 3 contribuye al progreso en la evaluación del bienestar a través de la validación de la Escala de Satisfacción con la Vida Temporal (*Temporal Satisfaction with Life Scale, TSWLS*), que permite una evaluación más precisa de la satisfacción con la vida (SV), uno de los principales componentes del bienestar (Pavot, Diener, y Suh, 1998). Sin embargo, sólo unos pocos estudios han analizado su estructura, no siempre encontrando los mismos resultados (McIntosh, 2001; Pavot y cols., 1998; Ye, 2007), y sólo uno analizó su estructura en una muestra española, compuesta únicamente por participantes mayores (Tomás y cols., 2016). Además, este estudio también exploró la relación entre la SV temporal (pasada, presente y futura), variables sociodemográficas y el componente afectivo del bienestar subjetivo (es decir, el afecto positivo y

negativo). Con respecto a las variables sociodemográficas, se analizó la relación entre la SV temporal y la edad y el género, puesto que estudios previos encontraron resultados divergentes con respecto a la relación con el género (McIntosh, 2001; Pavot y cols., 1998; Ye, 2007), y sólo un estudio exploró su relación con la edad en una muestra de mujeres de habla alemana (Proyer, Gander, Wyss, y Ruch, 2011). Con respecto a la relación entre la SV temporal y el componente afectivo del bienestar, los estudios previos realizados se habían realizado con la SV general, sin tener en cuenta el factor temporal (p. ej. Kuppens, Realo, y Diener, 2008; Nes y cols., 2013), y sólo dos estudios habían explorado esta relación teniendo en cuenta el factor temporal, si bien ninguno de ellos se aplicó en una muestra con un amplio rango de edad ni de habla hispana (Pavot y cols., 1998; Sailer y cols., 2014).

Para la realización de este estudio se tradujo al español la escala original y se aplicó a una muestra de 491 participantes con un rango de edad de 18 a 80 años (M = 32.07, DT = 14.59).

Las medidas incluidas en este estudio fueron la TSWLS, la Escala de Afecto Positivo y Negativo (Sandín y cols., 1999), la escala de felicidad (Fordyce, 1988), y el inventario de depresión de Beck (Sanz, Navarro, y Vázquez, 2003).

Se realizó un análisis factorial confirmatorio para analizar la estructura y las propiedades psicométricas de la validación española de la TSWLS con el método de máxima verosimilitud, y se realizaron ANOVAs para explorar la relación entre la edad, el género y los tres ejes temporales de la SV. Además, para explorar la relación entre la SV temporal y el componente afectivo del bienestar, se realizaron análisis de correlación bivariada y análisis de regresión entre estas medidas.

El análisis factorial confirmatorio mostró que la versión española de la TSWLS respondía a la misma estructura factorial que otros estudios anteriores (McIntosh, 2001; Pavot y cols., 1998; Ye, 2007), y además presentaba buenas propiedades psicométricas.

Los ANOVAs mostraron que los niveles de SV presente eran mayores que los de SV pasada en toda la muestra y que, analizando las puntuaciones según la edad de los participantes, sus los niveles de SV temporal diferían según la edad de los participantes. Con respecto al género, no se encontraron diferencias significativas.

Por lo que se refiere a la relación entre la SV temporal y el componente afectivo, tal como se esperaba, se encontraron correlaciones significativas positivas entre la SV temporal (pasada, presente y futura) y el estado de ánimo positivo (afecto positivo y felicidad), y al contrario en el caso del estado de ánimo negativo (afecto negativo y sintomatología depresiva). Sin embargo, los análisis de regresión mostraron que, según el eje temporal analizado, diferentes variables predecían los niveles de SV: la felicidad emergió como un predictor significativo de la SV presente, mientras que el afecto positivo era un predictor de la SV pasada y futura. El estado de ánimo negativo jugó un papel menor en estas predicciones. Los resultados obtenidos van en la línea de otros estudios previos (Diener y Seligman, 2002; Pavot y Diener, 2008; Pavot y cols., 1998; Sailer y cols., 2014)

Los hallazgos obtenidos en este estudio arrojan luz sobre la importancia de incluir el factor temporal en la evaluación de la SV, lo que puede contribuir a una mejor comprensión de uno de los principales componentes del bienestar subjetivo. En concreto, este estudio ayuda a esclarecer cómo se distribuyen los niveles de la SV pasada, presente y futura en diferentes grupos de edad y cómo se relacionan el estado de ánimo y la SV temporal. Además, este trabajo confirma que la TSWLS puede ser utilizada para evaluar la SV temporal en muestras habla hispana.

Capítulo 4. Mi mejor yo en el pasado, presente o futuro: Resultados de dos ensayos controlados aleatorizados

En este Capítulo se presentan dos ensayos controlados aleatorizados en los que se manipuló el enfoque temporal de la MYP original, realizados con el objetivo de examinar el papel de la temporalidad. Esta intervención ha sido generalmente considerada como una IPP orientada al futuro (p. ej. Malouff y Schutte, 2016), y aunque la temporalidad ha sido propuesta como un factor relevante de las IPP (Lyubomirsky y Layous, 2013; Wellenzohn, Proyer, y Ruch, 2016), no está claro si es un factor relevante en el caso del MYP. Basándose en hallazgos anteriores (Wellenzohn y cols., 2016), se esperaba que todas las variantes temporales fueran efectivas en el aumento del bienestar y que produjeran mejores resultados que la condición control.

Para realizar ambos estudios se crearon dos variantes de la MYP. La versión original pide a los/as participantes que escriban y visualicen su mejor yo en el futuro después de haber logrado todo lo deseado (King, 2001; Sheldon y Lyubomirsky, 2006). Con estas instrucciones como punto de partida, se manipuló la orientación temporal del MYP, generando dos nuevas variantes: el Mejor Yo Pasado (MYPA), que consistía en recordar y visualizarse a sí mismo/a en una época en la que los/as participantes consideraban que mostraron la mejor versión de sí mismos/as, y el Mejor Yo Presente (MYPRE), en la que los/as participantes se visualizaran a sí mismos/as en el presente, concretamente, en la mejor versión que ofrecían al mundo. Estas tres condiciones experimentales (MYP, MYPA, y MYPRE) se compararon con una condición control que consistía en escribir y visualizar las actividades realizadas durante las últimas 24 horas (Enrique, Bretón-López, Juana; Molinari, Baños, y Botella, 2017; Meevissen y cols., 2011; Sheldon y Lyubomirsky, 2006).

En ambos estudios, los participantes fueron asignados al azar a una de las cuatro condiciones (MYPA, MYPRE, MYP o control) y se les animó a practicar el ejercicio durante siete días. El Estudio 1 (N = 112) se aplicó a una muestra de estudiantes universitarios con un diseño mixto (el primer día se realizó en el

laboratorio, y durante los días siguientes los/as participantes practicaron a través de Internet), y el Estudio 2 (N = 108) se aplicó a la población general con un diseño completamente *online*.

La medida de resultado principal en el Estudio 1 fue el afecto positivo, medido a través de la escala de afecto positivo y negativo (López-Gómez, Hervás, y Vázquez, 2015), y las medidas secundarias incluyeron la escala de felicidad (Fordyce, 1988), la escala de la satisfacción temporal con la vida (Carrillo, Etchemendy, y Baños, 2018), la nueva escala general de autoeficacia (Chen, Gully, y Eden, 2001), el cuestionario de orientación de vida -revisado para medir optimismo (Otero, Luengo, Romero, Gómez, y Castro, 1998), y una medida ad-hoc de satisfacción con uno/a mismo/a.

En el caso del Estudio 2, las medidas se adaptaron a una intervención breve a través de Internet, previendo que las personas interesadas buscaban la participación en un estudio que no requiriera contestar largas baterías de cuestionarios. La medida principal de resultado fue el afecto positivo medido a través de una Escala Visual Análoga (EVA), y las medidas secundarias consistieron en ítems de escalas originales utilizadas en el Estudio 1, de modo que se extrajo un ítem para cada constructo (SV pasada, presente y futura, autoeficacia, y optimismo).

En los dos estudios se realizaron ANOVAs de medidas repetidas en cada medida para analizar los cambios pre-post intervención entre las distintas condiciones, y se calcularon los TE intragrupo para explorar la magnitud de los cambios pre-post intervención producidos en cada condición.

Ambos estudios mostraron resultados similares, confirmando la primera hipótesis planteada: los ANOVAs de medidas repetidas mostraron que el afecto positivo, la felicidad, la autoeficacia, el optimismo, y la SV temporal aumentaron significativamente y el afecto negativo disminuyó significativamente después de una semana de práctica en todas las variantes temporales en el Estudio 1. Además, la satisfacción con uno/a mismo/a aumentó significativamente en las

condiciones BPRES y BPS. En el Estudio 2, se encontraron los mismos resultados excepto en el caso del optimismo. Los tamaños del efecto intragrupo en el Estudio 1 señalaron resultados significativos en las condiciones experimentales, en contraste con la condición de control, que no mostró ningún tamaño del efecto intragrupo significativo. En el Estudio 2 surgió un patrón similar, aunque la condición control mostró un tamaño de efecto significativo en una de las variables.

Por otra parte, no se encontraron diferencias entre las condiciones experimentales y control, por lo que no se confirmó la segunda hipótesis sobre la superioridad de las condiciones experimentales sobre la condición de control, dado que la última también produjo aumentos en el bienestar. Estos resultados pueden deberse a una activación de información positiva relevante para uno/a mismo/a, lo que se había propuesto como un posible componente común a las PPI y a determinados grupos control (Mongrain y Anselmo-Matthews, 2012) y a una posible falta de potencia estadística para encontrar resultados significativos, ya que estos son altamente dependientes del tamaño muestral. Los tamaños del efecto intragrupo encontrados sugieren que es posible que con una muestra más grande hubieran surgido diferencias significativas, ya que los tamaños del efecto no son directamente dependientes del tamaño muestral (Gerber y Malhotra, 2008; Kühberger, Fritz, y Scherndl, 2014).

Dado que este Capítulo incluyó dos ensayos controlados aleatorizados que compartían el mismo diseño, a excepción de las tecnologías utilizadas en su implementación, es posible comparar los resultados de ambos estudios, aunque la evaluación no fue exactamente equivalente (ya que el Estudio 2 redujo el número de preguntas para disminuir la carga producida por la evaluación). La elevada similitud en los resultados obtenidos en ambos estudios sugiere que la adaptación a un formato *online* de las instrucciones y la metodología fue efectiva y que es factible implementar estas intervenciones en forma de IPPI.

En conclusión, este es el primer estudio que analiza el papel que tiene el enfoque temporal en la eficacia de la intervención MYP. Los resultados sugieren que la temporalidad no juega un papel significativo en términos de la eficacia de la intervención, debido a que todas las variantes produjeron mejorías en las medidas de bienestar, y que es posible implementarlas completamente a través de Internet.

Capítulo 5. Análisis cualitativo del Mejor Yo Posible: mecanismos subyacentes que influyen en su eficacia.

En el estudio contenido en el Capítulo 5 se presenta un análisis del contenido de los textos del MYP y sus variantes temporales, con el fin de explorar sus características y su relación con la eficacia de las intervenciones, dado que a pesar de las pruebas sobre la eficacia de la intervención MYP, poco se sabe sobre cómo funciona esta actividad positiva (Carrillo, Rubio-Aparicio, y cols., 2018; Loveday y cols., 2016). Una de las opciones que puede ayudar a desentrañar los procesos que tienen lugar en la elaboración del MYP es el análisis cualitativo de los textos, ya que esta intervención requiere que los/as participantes se expresen por escrito en una redacción. Sin embargo, hasta la fecha solamente dos estudios han analizado el contenido de los textos de los participantes que practicaron el MYP (Hill, Terrell, Arellano, Schuetz, y Nagoshi, 2015; Loveday, Lovell, y Jones, 2017), y ambos bajo modelos específicos que no recogían la totalidad del contenido, y en ningún caso incluyendo la relación de este contenido con la eficacia del ejercicio en la mejora del bienestar.

Se analizaron los textos del Estudio 1 (Capítulo 4) de las condiciones MYPA, MYPRE y MYP, tras eliminar dos textos por no ajustarse a las instrucciones, por lo que la muestra estuvo compuesta por 79 participantes (M = 20,23, DT = 4,10).

Los análisis de los textos se llevaron a cabo siguiendo el método consensuado de investigación cualitativa (Spangler, Liu, y Hill, 2012), y se extrajeron los temas y características de los textos que recogían las ideas contenidas en las

redacciones del MYPA, MYPRE, MYP. Por ejemplo, se identificaron temas como la familia, la pareja, el ámbito profesional/educativo, o las características personales positivas. Con respecto a las características de los textos, se recogieron la valencia emocional (el total de estados emocionales positivos menos el total de estados emocionales negativos) o la longitud del texto (número de palabras), entre otras.

Los valores de Kappa mostraron altos niveles de acuerdo. La medida de eficacia que se tomó fue la subescala de afecto positivo de la Escala de Afecto Positivo y Negativo (López-Gómez y cols., 2015), una de las medidas más utilizadas en estudios anteriores sobre el MYP (Loveday y cols., 2016), y la medida principal del Estudio 1.

Para analizar las diferencias entre condiciones con respecto al contenido y las características de los textos, se realizaron análisis multivariados de la varianza (MANOVAs). Para analizar si estos predecían el cambio en el afecto positivo se realizaron análisis de regresión. Por último, para explorar si las características de los textos mediaban el efecto del contenido sobre el afecto positivo, se realizaron análisis de mediación.

Los resultados principales mostraron que las diferentes condiciones escribieron sobre temas distintos cuando describieron su mejor yo. Por ejemplo, los/as participantes de la condición MYPRE escribieron con mayor frecuencia sobre sus características personales positivas que el resto de participantes, y quienes escribieron sobre su MYPA incluyeron más a menudo sus relaciones de amistad que en las otras dos condiciones.

Además, los análisis de regresión también arrojaron resultados dispares según la condición: revelaron que la valencia emocional de los textos predecía el cambio en el afecto positivo en la condición MYPA, mientras que para la condición MYP, eran la longitud del texto y la aparición del tema académico/profesional extrínseco lo que predecía el cambio en el afecto

positivo. En el caso de MYPRE, ninguna variable se mantuvo como predictor significativo.

Por último, los análisis de mediación también mostraron resultados distintos según la condición. En la condición MYPA, la valencia emocional del texto mediaba los efectos producidos en el afecto positivo por escribir sobre amistad y pareja, y en la condición MYP la longitud del texto mediaba los efectos producidos por escribir sobre las propias características personales positivas y la familia. De nuevo, no se encontraron resultados significativos para la condición MYPRE. Estos resultados sugieren que, cuando los/as participantes en la condición MYPA escribieron sobre los temas de amistad y pareja, escribieron textos más positivos, lo que produjo mayores incrementos en el afecto positivo. De la misma manera, cuando los/as participantes en condición de MYP escribieron sobre sus características positivas o la familia, escribieron textos más largos, lo que produjo mayores incrementos en el afecto positivo.

Este estudio es el primer intento de combinar el contenido de los textos de las intervenciones del MYP y su eficacia para aumentar el afecto positivo y muestra que, a pesar de los efectos similares encontrados en el Capítulo 4, estas intervenciones responden a diferentes mecanismos subyacentes: hay diferencias en el contenido y la forma de las composiciones de las tres intervenciones y, lo más importante, estas diferencias parecen predecir el cambio en el afecto positivo.

Discusión

En conclusión, esta tesis contribuye al conocimiento de una PPI ampliamente utilizada, y a responder a las nuevas preguntas sobre cómo y por qué funciona. Concretamente, se encontraron los siguientes resultados:

- El MYP es una intervención eficaz para aumentar los niveles de bienestar, el afecto positivo y el optimismo, y para disminuir los síntomas depresivos y el afecto negativo.

- La temporalidad es un factor relevante en la evaluación de la satisfacción de la vida.

- Sin embargo, la temporalidad no parece afectar directamente la eficacia de la intervención del MYP.

- Las condiciones control pueden no ser tan inocuas como se esperaba, dado que producen beneficios en el bienestar.

- Las TIC son recursos valiosos para implementar la intervención MYP y sus variantes temporales.

- Los mecanismos que subyacen a las diferentes variantes temporales del MYP son diferentes.

Para poder interpretar plenamente los principales hallazgos encontrados en esta tesis doctoral, es importante también destacar las fortalezas y limitaciones generales que presenta. Con respecto a las fortalezas de esta tesis, cabe destacar que: (1) se compone de diferentes estudios que han seguido altos estándares metodológicos (por ejemplo, el metaanálisis siguió una metodología rigurosa basada en todas las directrices de PRISMA, y el Capítulo 4 incluyó dos estudios controlados aleatorizados con cálculo a priori del tamaño de la muestra), (2) incluye el primer examen del papel de la orientación temporal en la eficacia de la intervención MYP, (3) los dos estudios del Capítulo 4 tienen el mismo diseño y su única diferencia es el nivel de presencia de las TIC, lo que permite replicar sus hallazgos y comparar la viabilidad y eficacia de un diseño *online*, (4) este trabajo también incluye el primer estudio sobre los mecanismos que subyacen a la eficacia del MYP a través del análisis cualitativo de los textos.

Esta tesis no está exenta de las siguientes limitaciones: (1) aun cuando el tamaño mínimo de la muestra necesaria se calculó para los Estudios 1 y 2 en el Capítulo 4, los datos sugieren que el tamaño muestral puede haber sido demasiado pequeño, (2) las muestras incluidas en los estudios del Capítulo 4 son jóvenes y se componen de estudiantes universitarios y población general, dejando a un lado otros tipos de población vulnerable, lo que limita la generalización de sus resultados y la imposibilidad de analizar si ha podido darse un efecto techo en los mismos, (3) el Capítulo 4 no incluyó medidas de seguimiento tras la intervención, por lo que no se analizaron los efectos a largo plazo producidos por las intervenciones, y (3) el Capítulo 5 ayudó en parte a arrojar luz sobre los procesos que no se pueden obtener con los datos cuantitativos, pero sólo incluyó los textos del Estudio 1 y una medida cuantitativa.

Este trabajo ha dado lugar a futuras líneas de investigación, que además de subsanar las limitaciones previamente mencionadas, invitan a: (1) investigar otros factores relacionados con la eficacia de la intervención además de su temporalidad, por ejemplo la activación de contenido no directamente asociado a uno/a mismo/a, (2) explorar a fondo lo que constituye una condición control en Psicología Positiva y por qué en ocasiones se han encontrado resultados positivos en la mejora del bienestar (e.g. King, 2001; Mongrain y Anselmo-Matthews, 2012; Seligman y cols., 2005), (3) analizar los efectos de las intervenciones utilizadas en esta tesis doctoral en muestras con mayor heterogeneidad en cuestión de edad, para explorar las posibles diferencias que pudieran surgir según la etapa vital de los/as participantes, (4) implementar las intervenciones en poblaciones con menores niveles de afecto positivo (por ejemplo, poblaciones subclínicas), para explorar si se producen mayores mejoras en comparación con la población general, (5) aplicar las intervenciones a través de aplicaciones móviles para aprovechar al máximo sus ventajas y favorecer la implicación de los/as participantes en su práctica diaria, (6) probar los efectos de diferentes combinaciones de las variantes del MYP, para analizar si la combinación de las variantes en una intervención más inclusiva es más

efectiva para aumentar el bienestar, y si el desarrollo de cada variante ayuda a construir las demás.

Finalmente, cabe mencionar que esta tesis ha dado lugar a nuevos proyectos relacionados con las direcciones futuras señaladas en esta discusión. Investigadores/as de la Universidad de Valencia, la Universidad de Twente y el Instituto Trimbos (Países Bajos) han estado trabajando para desarrollar un nuevo proyecto que tiene como objetivo comprobar si la combinación de las intervenciones incluidas en este trabajo es más efectiva para aumentar los niveles de bienestar que la intervención original del MYP, implementadas a través de aplicaciones móviles. Este trabajo está actualmente en curso, y ya está aprobado por el comité ético de la Universidad de Twente (16337) y registrado en el Instituto Nacional de Registro Sanitario de los Estados Unidos (NCT03072680).

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V

Summary in Valencian

Resum en valencià

Introducció

Intervencions Psicològiques Positives i benestar

Exceptuant els ja clàssics models teòrics sobre el benestar (p. ex. Diener, 1984; Ryff, 1989) i alguns treballs pioners dirigits específicament a desenvolupar noves formes d'incrementar la felicitat (p. ex. Fordyce, 1977), l'interès científic sobre les facetes positives de la vida no va florir fins a finals dels anys 90, amb l'arribada oficial del moviment de la Psicologia Positiva (Seligman i Csikszentmihalyi, 2000). A partir d'aqueix moment, l'atenció per part del col·lectiu científic sobre com explicar i fomentar el benestar de les persones ha anat en augment. Existeix una extensa evidència sobre la importància i els beneficis de promoure les emocions positives i el benestar, i fins i tot l'Organització Mundial de la Salut (OMS) les va incloure en la seua descripció de la salut mental, definida com la presència d'un estat de ple benestar físic, mental i social, i no simplement la mera absència de malaltia mental (WHO, 2001). En altres paraules, per a aconseguir la salut mental no n'hi ha prou amb treballar únicament en l'alleujament dels símptomes, sinó que també és important treballar activament en la promoció del benestar i, per tant, investigar nous paradigmes que ajuden a millorar-ho.

A més, tal com afirma la "teoria d'ampliació i construcció" (Fredrickson, 2001), la promoció de les emocions positives no solament és un propòsit valuós en si mateix, sinó també un mitjà per a un funcionament òptim a llarg termini. Contràriament als efectes produïts per les emocions negatives, que constrenyen les cognicions i fomenten uns repertoris específics d'acció per a ajudar a l'individu a manejar una situació adversa, les emocions positives amplien les maneres habituals de pensar o actuar d'un individu (per exemple, l'alegria amplia la creativitat, i l'interès promou l'exploració i la cerca de nova informació), la qual cosa pot ajudar a construir recursos personals a llarg termini com, per exemple, una major resiliència (Fredrickson, 2001).

En resposta a l'augment contemporani en l'interès pel benestar, les Intervencions Psicològiques Positives (IPP) van sorgir com a recursos prometedors que podrien ajudar a les persones a florir. El seu objectiu és augmentar el benestar de les persones cultivant sentiments, cognicions o conductes positives (Bolier i cols., 2013; Mitchell, Vella-Brodrick, i Klein, 2010; Sin i Lyubomirsky, 2009). Per la seua definició, es pot inferir que les intervencions dirigides principalment a disminuir el sofriment dels pacients o a reduir la seua psicopatologia no es considerarien IPP: el factor clau d'aquest tipus d'intervencions és l'objectiu específic de cultivar directament el funcionament positiu i el benestar, en lloc de centrar-se en l'alleujament de la simptomatologia.

Sota el paraigua de les IPP, s'han desenvolupat nombrosos estudis per desenvolupar i provar l'eficàcia de diferents IPP, que habitualment són fàcils d'implementar i no requereixen un entrenament o unes habilitats específiques per part dels/les participants. Encara que totes les IPP comparteixen el mateix objectiu (promoure el benestar), els mitjans utilitzats per a aconseguir aquest objectiu són molt heterogenis. S'han dut a terme nombrosos i diversos estudis en els quals s'ha avaluat l'eficàcia de les diferents IPP, mostrant augments en els nivells de benestar en comparació de les condiciones control (Bolier i cols., 2013; Sin i Lyubomirsky, 2009). És possible organitzar les IPP pel que fa al marc temporal en el qual se centren, sent categoritzades com IPP associades al passat (per exemple, escriure sobre experiències passades positives o escriure cartes d'agraïment), al present (per exemple, la realització d'actes diaris d'amabilitat, o assaborir els esdeveniments positius quan ocorren), o al futur (imaginar esdeveniments positius que podrien ocórrer en un futur pròxim o imaginar-se a un/a mateix/a en el millor futur possible, una vegada aconseguit tot el que es desitjava) (Alden i Trew, 2013; Baikie, Geerligs, i Wilhelm, 2012; Boehm, Lyubomirsky, i Sheldon, 2011; Burton i King, 2004; Hurley i Kwon, 2012; King, 2001; O'Connell, O'Shea, i Gallagher, 2016; Quoidbach, Wood, i Hansenne, 2009; Seligman, Steen, Park, i Peterson, 2005; Smith, Harrison, Kurtz, i Bryant, 2014). A més, existeixen programes que combinen diferents

intervencions, en els quals no solament s'utilitza un únic exercici específic, sinó una combinació d'IPP que pot ser molt heterogènia (p. ex. Flink, Smeets, Bergbom, i Peters, 2015; Manicavasagar i cols., 2014; Page i Vella-Brodrick, 2013).

Fins avui, s'han realitzat dos metaanàlisi sobre l'eficàcia de les IPP en la millora del benestar (Bolier i cols., 2013; Sin i Lyubomirsky, 2009), que han mostrat que les IPP són intervencions eficaces per a augmentar el benestar. No obstant això, els resultats derivats dels mateixos van incloure una àmplia gamma d'IPP tan diverses com activitats destinades a promoure la gratitud, l'optimisme o la bondat, la psicoteràpia positiva o la teràpia d'atenció plena (*mindfulness*), així com diversos programes integrals d'IPP, per la qual cosa els seus resultats no poden atribuir-se a intervencions específiques, sinó a les IPP en el seu conjunt. Per aquesta raó, és necessari dur a terme metaanàlisi d'IPP específiques per a complementar aquests resultats (Bolier i cols., 2013).

Per què funcionen les IPP?

Tenint en compte l'evidència existent sobre les IPP, es pot concloure que aquestes intervencions són mitjans valuosos per a la promoció del benestar. No obstant això, com a conseqüència de la progressió en el coneixement d'aquestes intervencions i després de quasi dues dècades des de l'arribada del moviment de la Psicologia Positiva, una nova pregunta ha sorgit: per què funcionen les IPP? En altres paraules, quins són els mecanismes que produeixen la seua eficàcia? Encara que aquesta pregunta segueix sense resposta, s'han desenvolupat alguns models per a avançar en aquesta matèria.

D'una banda, Quoidbach, Mikolajczak i Gross (2015) van proposar un marc per a integrar la investigació de les IPP dins del model de regulació emocional (Gross, 1998), que es refereix al procés en el qual l'individu influeix activament en les seues emocions. En aquest marc, els esforços per a augmentar les emocions positives s'organitzen segons els processos psicològics que tenen

lloc i el marc temporal en el qual s'utilitzen. Aquests processos fan referència a les estratègies utilitzades pels individus per a regular les seues emocions positives (per exemple, seleccionar una situació en funció de les conseqüències emocionals esperades, atendre als aspectes positius de l'experiència, replantejar el significat de la situació, etcètera), que s'organitzen dins d'un marc temporal, depenent del moment en què es despleguen: ja siga abans (a través de l'anticipació), durant l'esdeveniment (a través de la pròpia experiència), o després de l'esdeveniment (a través de la reminiscència). Seguint la lògica del model, les IPP poden organitzar-se en funció de les estratègies que s'activen en practicar-les i del moment en què es produeixen. Per exemple, la IPP "assaborir el moment" es categoritzaria com una focalització de l'atenció durant l'esdeveniment (a través de l'experiència).

D'altra banda, les teories de "l'ajust persona-activitat" desplacen el focus d'atenció de les intervencions en si mateixes cap a la interacció entre aquestes i les característiques dels individus que les practiquen (Lyubomirsky i Layous, 2013; Schueller, 2014). Aquestes teories assumeixen que les diferents IPP seran més beneficioses per a uns individus que para uns altres, segons les característiques de tots dos. Concretament, emfatitzen la importància que el "ajust" entre tots dos (persona i activitat) té en els efectes sobre el benestar obtinguts per les IPP. Lyubomirsky i Layous (2013) van combinar aquest marc teòric i l'evidència existent d'estudis previs per a desenvolupar el "model de les activitats positives", en el qual van proposar diverses característiques dels individus que probablement promourien el benestar a llarg termini si es combinaren amb algunes característiques de la pròpia activitat positiva.

Exemples de les característiques dels usuaris de les IPP són la motivació per a participar en l'activitat, el seu esforç per realitzar-la, els seus trets de personalitat, el suport social, les característiques demogràfiques i el nivell afectiu previ a l'inici de l'activitat. Quant a les característiques de les intervencions, el model proposa dos tipus: les que es poden aplicar a qualsevol IPP, i les que diferencien una IPP d'una altra. Les primeres són la dosi prescrita

(per exemple, practicar l'activitat una vegada a la setmana o una vegada al dia), la varietat (per exemple, practicar només un tipus d'intervenció o una combinació), la seqüència de la pràctica (per exemple, l'activitat inicial en un paquet integral d'IPP) i el suport social rebut per a la pràctica. Quant a les característiques que permeten diferenciar entre les IPP, s'han proposat l'orientació social de l'activitat (és a dir, si estan orientades a uns altres com realitzar actes de bondat, o orientats a un/a mateix/a com practicar el pensament optimista), la naturalesa cognitiu-conductual de l'activitat (és a dir, si l'activitat proposada és social-conductual com ser amable o reflexiva-cognitiva com assaborir el moment), i el focus temporal específic (per exemple, activitats centrades en el passat com a intervencions de gratitud, en el present com assaborir el moment o en el futur com visualitzar-se a un/a mateix/a en el millor futur possible).

L'interès de la recerca sobre aquestes característiques va en augment i, en aquest sentit, els estudis empírics que inclouen variables personals com a possibles moderadors de l'eficàcia de les diferents IPP estan creixent exponencialment (p. ex. Antoine, Dauvier, Andreotti, i Congard, 2018; Harbaugh i Vasey, 2014; Lyubomirsky i Layous, 2013; Proyer, Gander, Wellenzohn, i Ruch, 2016a; Seear i Vella-Brodrick, 2013).

Quant a les característiques de les IPP que es diferencien entre si, només s'han publicat uns pocs estudis. Un exemple és el treball de Wellenzohn i el seu equip (Wellenzohn, Proyer, I Ruch, 2016), que van considerar la temporalitat de les IPP com un factor clau per a la seua eficàcia. Van manipular la temporalitat d'una IPP basada en l'humor i van trobar beneficis similars en les diferents versions de la intervenció (passada, present o futura), encara que els mecanismes subjacents a la seua eficàcia eren diferents. Un altre estudi rellevant és el de Mongrain i Anselmo-Matthews (2012). En aquest estudi, es va manipular explícitament una condició de control perquè s'igualara amb altres IPP prèviament validades (Seligman i cols., 2005), i no es van trobar diferències entre aquesta condició control i les IPP. Després d'aquests resultats, van

proposar que un dels principals elements de les IPP que podien estar produint beneficis era l'activació d'informació positiva rellevant per a un/a mateix/a.

Els models esmentats i els estudis empírics relacionats destaquen la influència que algunes variables poden tenir sobre l'eficàcia de les IPP general, les quals poden utilitzar-se per a fomentar la seua eficàcia i traure el màxim profit de les mateixes. Siga com siga, la recerca sobre per què i com funcionen les activitats positives es troba encara en les seues primeres etapes i necessita ser explorada més a fons, per la qual cosa la pregunta sobre per què funcionen les IPP segueix sense tenir una resposta clara (Bolier i cols., 2013; Lyubomirsky i Layous, 2013; Mongrain i Anselmo-Matthews, 2012; Wang i cols., 2017). A més, aquests primers estudis i models s'han aplicat principalment a tota la gamma de les IPP en general i s'han centrat principalment en els factors moderadors dels individus, per la qual cosa no expliquen quins són els mecanismes precisos que subjauen i expliquen per què i com funciona cada IPP específicament. Per tant, és necessari continuar la recerca sobre els factors que fan que cada IPP siga individualment eficaç.

IPP i les Tecnologies de la Informació i de la Comunicació

La Psicologia Positiva s'ha desenvolupat juntament amb el creixement de l'era digital i tots dos avanços no han sigut independents: fins i tot des de la seua creació, la Psicologia Positiva ha estat relacionada amb el camp de les Tecnologies de la Informació i la Comunicació (TIC). En 2018, els usuaris d'Internet han arribat fins al 54,4% de la població mundial, sent especialment elevats a Europa (85,2%) i Amèrica del Nord (95%; Internet World Stats, 2018). En la mateixa línia, al voltant del 59% de la població mundial va informar que posseïa un *smartphone* en 2017 (Pew Global, 2018). Aquestes estadístiques confirmen la gran presencia que les tecnologies tenen en la nostra vida quotidiana, la qual no solament afecta a les rutines quotidianes de cada

persona, sinó que també ha influït en les intervencions que els/les professionals de la psicologia i la recerca estan desenvolupant.

Aquesta associació va portar al desenvolupament de les Intervencions de Psicologia Positiva disseminades a través d'Internet (IPPI), que tenen múltiples avantatges: major accessibilitat (Internet està disponible en qualsevol moment i des de molts llocs), cost-efectivitat (per exemple, estalvia temps als terapeutes), personalització (els continguts es poden personalitzar), opcions multimèdia (vídeos, imatges, etc. poden enriquir o substituir als texts), apoderament dels consumidors (els/es usuaris/es assumeixen un paper actiu en la seua participació o compromís i poden dirigir el seu propi procés d'aprenentatge), i anonimat, entre altres (Mitchell i cols., 2010). A més, en els últims anys, i com una conseqüència de la ràpida revolució en el camp dels telèfons intel·ligents, moltes d'aquestes IPPI són ara disseminades a través d'aquests dispositius en forma d'aplicacions específiques per a telèfons intel·ligents (*apps*). La seua aplicació a través de telèfons mòbils té, a més dels avantatges propis de les IPPI, potencialitats com a diferents sensors, enviament de missatges i recordatoris, cridades, fotografies i molt més. En conseqüència, poden ser eines extremadament útils per a realitzar intervencions de forma natural com a part de la rutina dels participants, donada la seua elevada ubiqüitat i els recursos innovadors que ofereixen, la qual cosa fa que la intervenció siga més flexible i atractiva.

Tots aquests avantatges ja estan sent utilitzades per els/les professionals per a dissenyar i desenvolupar intervencions encara més accessibles. Ja existeixen nombrosos estudis sobre IPPI, incloent també les disseminades en forma de *apps* que demostren que és factible disseminar IPP a través de les tecnologies, per la qual cosa els seus beneficis poden ser maximitzats (Daugherty i cols., 2018; Drozd, Mork, Nielsen, Raeder, i Bjørkli, 2014; Proyer, Gander, Wellenzohn, i Ruch, 2016b; Sergeant i Mongrain, 2015).

En conclusió, les TIC constitueixen un recurs que ha donat resultats prometedors en l'àmbit de la Psicologia Positiva. Aquesta aliança pot produir

grans avanços en la promoció del benestar dels individus: les TIC tenen la capacitat d'arribar a persones de tot el món i de proporcionar recursos adaptats a les poblacions diana, la qual cosa seria impossible per a les IPP sense aquests valuosos mitjans.

El cas de la intervenció “el Millor Jo Possible”

La intervenció del Millor Jo Possible (MJP) és una de les IPP més utilitzades, amb més de 30 estudis publicats sobre la seua eficàcia (Loveday, Lovell, i Jones, 2016). En practicar aquesta activitat, se'ls demana als participants que escriguen sobre si mateixos/es en el millor futur possible, després d'haver obtingut tot el que desitjaven. Aquesta activitat té com a objectiu promoure una perspectiva positiva d'un/a mateix/a en el futur, i promou la generació d'aquesta imatge mental a través de l’escriptura d’una redacció.

Aquest exercici va ser desenvolupat per King (2001) com un primer intent de comparar paradigmes d'escriptura positius i negatius, avaluant els efectes d'aquest exercici i els obtinguts en escriure sobre un esdeveniment traumàtic, que havia demostrat prèviament ser beneficiós per a la salut com a conseqüència de processos d'expressió i alleujament emocional (Pennebaker, 1997). Aquest estudi pretenia respondre a la següent pregunta: és necessari escriure sobre un esdeveniment traumàtic per a produir beneficis per a la salut, o és possible produir-los a través de l'escriptura sobre temes menys angoixants? Basant-se en estudis anteriors, la seua autora va plantejar la hipòtesi que qualsevol tema auto-regulador podria produir beneficis de salut similars als de l'escriptura sobre trauma. L'estudi va incloure participants que van escriure sobre el seu MJP, l’esdeveniment viscut més traumàtic o les activitats que farien l'endemà (tema neutral). Van ser aleatoritzats/des a una d'aquestes condicions i van escriure sobre el tema assignat durant 20 minuts al llarg de quatre dies. Els resultats van mostrar que tant l'escriptura sobre trauma com sobre el MJP van ser beneficiosos per a la salut física, i que el MJP va

mostrar augments significatius en el benestar. A més, els participants en la condició del MJP van qualificar l'exercici com significativament menys angoixant que els participants en la condició d'escriptura sobre trauma.

Des de l'any 2001 fins ara s'han publicat nombrosos estudis per a avaluar l'eficàcia d'aquesta intervenció amb diferents mesures de benestar. Algun altre estudi va comparar l'eficàcia de l'escriptura sobre el MJP i sobre el trauma (Austenfeld, Paolo, i Stanton, 2006; Austenfeld i Stanton, 2008; Yogo i Fujihara, 2008), però des del sorgiment del moviment de la Psicologia Positiva, l'interès en els beneficis de l'exercici MJP va emigrar gradualment cap a la promoció del benestar i, com a resultat, l'interès en el paradigma de l'escriptura sobre trauma i l'alleujament dels símptomes va disminuir. Actualment, els grups de comparació són generalment grups en els quals els/les participants escriuen sobre temes neutrals (per exemple, les activitats realitzades durant les últimes 24 hores).

L'exercici MJP ha sigut utilitzat en diversos contextos i amb diferents objectius específics. La majoria dels estudis han utilitzat la intervenció com una forma de promoure el benestar dels participants, aplicant-la a través d'Internet (Layous i cols., 2013; Lyubomirsky, Dickerhoof, Boehm, i Sheldon, 2011), mentre que uns altres la van aplicar en persona, ja siga individualment (Enrique, Bretón-López, Molinari, Baños, i Botella, 2017; Ng, 2016), o en xicotets grups (Sheldon i Lyubomirsky, 2006).

Els estudis han trobat que el MJP, comparat amb les condiciones control, produeix augments significatius en l'afecte positiu i disminucions en l'afecte negatiu (Harrist, Carlozzi, McGovern, i Harrist, 2007; Meevissen, Peters, i Alberts, 2011), augments en la satisfacció amb la vida (Boehm i cols., 2011; Liau, Neihart, Teo, i El, 2016), felicitat (Ng, 2016), i el benestar (Odou i Vella-Brodrick, 2013) i optimisme (Boselie, Vancleef, i Peters, 2017; Hanssen, Peters, Vlaeyen, Meevissen, i Vancleef, 2013).

Com pot observar-se, l'exercici MJP és una IPP complexa que requereix que els/les participants escriguen i s'imaginen a si mateixos/es sota una perspectiva positiva, i que ha experimentat un creixement exponencial des del seu inici. Al llarg dels diferents estudis publicats, és possible observar que el MJP sembla una intervenció eficaç per a millorar el benestar. No obstant això, aquesta conclusió només pot derivar-se de l'anàlisi dels estudis individuals, ja que només existeix una revisió qualitativa d'aquesta intervenció, que no inclou cap anàlisi d'eficàcia (Loveday i cols., 2016). A més, la mateixa pregunta que concerneix a altres IPP també envolta a aquesta intervenció: es desconeix què característiques fan que aquesta intervenció siga efectiva i si existeixen factors específics que puguen estar a la base de la seua efectivitat. Per tant, és necessari seguir explorant l'eficàcia global d'aquesta intervenció i les seues característiques idiosincràtiques.

Objectius

Tal com s'ha esmentat anteriorment, les IPP poden ser recursos valuosos per a promoure el benestar en els individus, i en aquest context, l'exercici del MJP sembla ser un enfocament prometedor. No obstant això, encara que existeixen molts estudis individuals publicats sobre la seua eficàcia, encara es desconeix quin és l'eficàcia general d'aquesta intervenció. A més, la recerca sobre els mecanismes que subjauen a l'eficàcia d'aquesta activitat positiva és escassa. En aquest sentit, la temporalitat s'ha plantejat com un factor rellevant que val la pena seguir explorant: fins i tot els models teòrics desenvolupats per a aclarir el funcionament de les IPP coincideixen en la importància que la temporalitat pot tenir per a desentranyar com funcionen aquestes intervencions. No obstant això, no és clar quin paper exerceix el marc futur en la intervenció MJP.

Per tant, l'objectiu d'aquesta tesi és doble: explorar l'eficàcia global del MJP i analitzar el paper dels mecanismes que poden influir en la seua eficàcia. Concretament, s'examinarà el paper del focus temporal.

Específicament, aquesta tesi té els següents objectius:

1) Revisar l'eficàcia general de la intervenció MJP segons l'evidència empírica existent.

2) Contribuir a una avaluació més precisa del benestar considerant el marc temporal.

3) Dissenyar i desenvolupar dues variants temporals del MJP que seran aplicades a través de TIC.

4) Analitzar l'eficàcia de les tres versions temporals del MJP, aplicades a través de les TIC, per a augmentar el benestar.

5) Analitzar els possibles mecanismes subjacents a la seua eficàcia, mitjançant anàlisis qualitatives dels textos.

Metodologia i resultats

Per a aconseguir els objectius plantejats, es van realitzar 5 estudis organitzats en 4 Capítols.

El Capítol 2 té com a objectiu l'anàlisi de l'eficàcia general de la intervenció del MJP segons l'evidència existent, i consisteix en una revisió sistemàtica i metaanàlisi sobre l'eficàcia de la intervenció en la millora del benestar.

L'objectiu del Capítol 3 és contribuir a una avaluació més precisa d'un dels components del benestar, la satisfacció amb la vida, tenint en compte el marc temporal. En concret, aquest Capítol descriu la validació espanyola d'una escala que mesura la satisfacció de la vida temporal, i que s'utilitzarà posteriorment en estudis continguts en el Capítol 4. En aquest estudi, a més, s'explora la relació entre aquest constructe amb variables sociodemogràfiques i amb el component afectiu del benestar subjectiu.

El Capítol 4 tracta del disseny i desenvolupament de dues variants temporals del MJP (Millor Jo Passat, i Millor Jo Present) aplicades a través de TIC, i de l'anàlisi de la seua eficàcia en l'augment dels nivells de benestar. En concret, inclou dos estudis amb dissenys controlats aleatoritzats (Estudi 1 i Estudi 2), en els quals es descriuen les dues variants temporals de l'exercici MJP desenvolupades, i que analitzen l'eficàcia de les tres versions del MJP en comparació d'una condició control.

El Capítol 5 té com a objectiu aprofundir en la recerca sobre l'eficàcia del MJP, i en concret, se centra a analitzar els possibles mecanismes subjacents a la seua eficàcia. Inclou un disseny mixt en el qual es combina una anàlisi qualitativa dels textos inclosos en l'Estudi 1 amb dades quantitatives sobre l'eficàcia de la intervenció per a millorar l'afecte positiu.

Capítol 2. Eficàcia de la intervenció "el Millor Jo Possible": una revisió sistemàtica i metaanàlisi

En aquest Capítol es presenta un metaanàlisi i una revisió sistemàtica de la intervenció del MJP. Fins avui, i després de quasi 20 anys des del primer estudi realitzat sobre aquesta intervenció (King, 2001), per a analitzar l'eficàcia d'aquest exercici, calia revisar els resultats dels diferents estudis individuals, independentment de les seues característiques específiques, ja que els metaanàlisi existents (Bolier i cols., 2013; Malouff i Schutte, 2016; Sin i Lyubomirsky, 2009) incloïen alguns dels estudis publicats sobre el MJP, però incloïen moltes altres intervencions no relacionades amb aquesta. Fins a on sabem, aquest és el primer metaanàlisi que analitza la seua eficàcia.

La selecció d'estudis inclosos en el metaanàlisi es va dur a terme per part de dues revisores independents, amb els següents criteris d'inclusió: ser un estudi empíric sobre l'eficàcia del MJP, incloure qüestionaris relacionades amb el benestar o la depressió, incloure un mínim de dos grups (MJP i grup control), proporcionar suficients dades estadístiques per al càlcul de la grandària de

l'efecte, i estar escrit en anglès o espanyol. Es va realitzar una cerca sistemàtica que va incloure, finalment, 28 estudis (alguns dels quals incloïen un grup addicional que va practicar un exercici de gratitud) amb una mostra total de 2.863 participants (1.247 en grups MJP, 1.155 en grups control i 461 en grups de gratitud).

Les mesures de resultat utilitzades van ser: benestar, optimisme, afecte positiu i negatiu i depressió, i la grandària de l'efecte utilitzat va ser la diferència mitjana estandarditzada entre el canvi produït per la condició MJP i el canvi produït pel grup control. Es van analitzar per separat els resultats obtinguts per intervencions MJP breus (una sola sessió) i per intervencions MJP més llargues (més d'un dia de pràctica).

A més, es van considerar 15 variables moderadores potencials relatives a la mostra, el mètode d'implementació de la intervenció (per exemple, a través d'Internet), les característiques de la intervenció en si mateixa (per exemple, el total de dies de durada) i la qualitat dels estudis.

Es van realitzar metaanàlisis separats per a cadascuna de les cinc mesures de resultat, ANOVAs i meta-regressions per a analitzar el paper de les variables moderadores i es va analitzar també la presència de risc de publicació.

Els resultats van mostrar que el MJP pot considerar-se una intervenció efectiva per a augmentar els nivells de benestar en comparació dels controls, tant com a sessió breu com a intervenció més llarga. Concretament, la intervenció va mostrar ser eficaç per a augmentar els nivells de benestar (d_+ = .291 i d_+ = .381), optimisme (d_+ = .378, i d_+ = .278), i afecte positiu (d_+ = .339 i d_+ = .657), i com a intervenció llarga per a disminuir els símptomes depressius (d_+ = .115) i l'afecte negatiu (d_+ = .411). Considerant la magnitud de les grandàries de l'efecte obtinguts, sembla que la MJP mostra efectes més forts com una intervenció més curta (és a dir, de menor durada) excepte en el cas de l'afecte negatiu, que mostra un patró invertit.

Les anàlisis de moderadors no van llançar resultats significatius, excepte per una tendència cap a la significació en el cas de l'edat de la mostra (concretament als anys i desviació estàndard) i la magnitud de la intervenció (quantitat de minuts de pràctica), que podria indicar que el MJP podria ser més eficaç per als participants majors i en mostres més diversificades quant a edat, i amb una menor pràctica (menys minuts de pràctica en total). No obstant això, a la falta de significació estadística, aquests resultats han de prendre's amb precaució.

Atès que alguns estudis també van incloure un grup addicional que practicava un exercici de gratitud, va ser possible realitzar un metaanàlisi per a comparar els efectes del MJP i els de la intervenció en gratitud (encara que amb un nombre substancialment reduït d'estudis), que va demostrar la superioritat del MJP en la millora de l'afecte positiu i la disminució de l'afecte negatiu.

En resum, aquest estudi contribueix al coneixement de l'eficàcia de la intervenció del MJP, i és el primer enfocament quantitatiu realitzat amb l'objectiu d'estudiar la seua eficàcia global. Els resultats indiquen que el MJP és una activitat positiva que pot ser utilitzada per a augmentar el benestar dels qui la practiquen. No obstant això, cal assenyalar que les anàlisis dels moderadors no van mostrar evidència sobre quins factors o mecanismes estaven involucrats en la seua eficàcia (excepte per l'esmentada tendència a la significació en algunes variables), la qual cosa obri la porta a futures recerques destinades a desentranyar aquesta qüestió. Tanmateix, aquests resultats permeten recomanar aquesta activitat com un recurs rellevant per als/les professionals de la salut mental.

Capítol 3. La satisfacció amb la vida passada, present i futura i el paper de l'edat, i l'afecte positiu i negatiu

El Capítol 3 contribueix al progrés en l'avaluació del benestar a través de la validació de l'Escala de Satisfacció amb la Vida Temporal (*Temporal*

Satisfaction with Life Scale, TSWLS), que permet una avaluació més precisa de la satisfacció amb la vida (SV), un dels principals components del benestar (Pavot, Diener, i Suh, 1998). No obstant això, només uns pocs estudis han analitzat la seua estructura, trobant resultats diferents (McIntosh, 2001; Pavot i cols., 1998; Ye, 2007), i només un va analitzar la seua estructura en una mostra espanyola, composta únicament per participants majors (Tomás, Galiana, Oliver, Sancho, i Pinazo, 2016). A més, aquest estudi també va explorar la relació entre la SV temporal (passada, present i futura) i variables sociodemogràfiques, i el component afectiu del benestar subjectiu (és a dir, l'afecte positiu i negatiu). Pel que fa a les variables sociodemogràfiques, es va estudiar la relació entre la SV temporal i l'edat i el gènere, ja que estudis previs van trobar resultats divergents pel que fa a la relació amb el gènere (McIntosh, 2001; Pavot i cols., 1998; Ye, 2007), i només un estudi va explorar la seua relació amb l'edat en una mostra de dones de parla alemanya (Proyer, Gander, Wyss, i Ruch, 2011). Pel que fa a la relació entre la SV temporal i el component afectiu del benestar, els estudis realitzats es van centrar en l'anàlisi de la SV general, sense tenir en compte el factor temporal (p. ex. Kuppens, Realo, i Diener, 2008; Nes i cols., 2013), i només dos estudis van explorar aquesta relació tenint en compte el factor temporal, si ben cap d'ells es va aplicar en una mostra amb un ampli rang d'edat ni de parla hispana (Pavot i cols., 1998; Sailer i cols., 2014).

Per a la realització d'aquest estudi es va traduir a l'espanyol l'escala original i es va aplicar a una mostra de 491 participants amb un rang d'edat de 18 a 80 anys (M = 32.07, DT = 14.59).

Les mesures incloses en aquest estudi van ser la traducció de la TSWLS, l'escala d'afecte positiu i negatiu (Sandín i cols., 1999), l'escala de felicitat (Fordyce, 1988), i l'inventari de depressió de Beck (Sanz, Navarro, i Vázquez, 2003).

Es va realitzar una anàlisi factorial confirmatori per a analitzar l'estructura i les propietats psicomètriques de la validació espanyola de la TSWLS amb el mètode de màxima versemblança, i es van realitzar ANOVAs per a explorar la

relació entre l'edat, el gènere i els tres eixos temporals de la SV. A més, per a explorar la relació entre la SV temporal i el component afectiu del benestar (afecte positiu, felicitat, afecte negatiu i simptomatologia depressiva), es van realitzar anàlisi de correlació bivariada i anàlisi de regressió entre aquestes mesures.

L'anàlisi factorial confirmatori va mostrar que la versió espanyola de la TSWLS responia a la mateixa estructura factorial que altres estudis anteriors (McIntosh, 2001; Pavot i cols., 1998; Ye, 2007), i a més presentava bones propietats psicomètriques.

Les ANOVAs van mostrar que, en general, els nivells de SV present eren majors que els de SV passada, i que, analitzant els nivells segons l'edat dels participants, els seus els nivells de SV temporal diferien segons l'edat dels participants. Pel que fa al gènere, no es van trobar diferències significatives.

Pel que es refereix a la relació entre la SV temporal i el component afectiu, es van trobar correlacions significatives positives entre la SV temporal (passada, present i futura) i l'estat d'ànim positiu, i al contrari en el cas de l'estat d'ànim negatiu. No obstant això, les anàlisis de regressió van mostrar que, segons l'eix temporal analitzat, diferents variables predeien els nivells de SV: la felicitat va emergir com un predictor significatiu de la SV present, mentre que l'afecte positiu era un predictor de la SV passada i futura. L'estat d'ànim negatiu va jugar un paper menor en aquestes prediccions. Aquests resultats coincideixen amb altres estudis previs (Diener i Seligman, 2002; Pavot i Diener, 2008; Pavot i cols., 1998; Sailer i cols., 2014).

Les troballes obtingudes en aquest estudi emfatitzen la importància d'incloure el factor temporal en l'avaluació de la SV, la qual cosa pot contribuir a una millor comprensió d'un dels principals components del benestar subjectiu. En concret, aquest estudi ajuda a esclarir com es distribueixen els nivells de la SV passada, present i futura en diferents grups d'edat i com es relacionen l'estat

d'ànim i la SV temporal. A més a més, aquest treball confirma que la TSWLS pot ser utilitzada per a avaluar la SV temporal en mostres parla hispana.

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Capítol 4. El meu millor jo en el passat, present o futur: Resultats de dos assajos controlats aleatoritzats

En aquest Capítol es presenten dos assajos controlats aleatoritzats en els quals es va manipular l'enfocament temporal del MJP original, realitzats amb l'objectiu d'examinar el paper de la temporalitat. Aquesta intervenció ha sigut generalment considerada com una IPP orientada al futur (p. ex. Malouff i Schutte, 2016), i encara que la temporalitat ha sigut proposada com un factor rellevant de les IPP (Lyubomirsky i Layous, 2013; Wellenzohn, Proyer, i Ruch, 2016), no és clar si és un factor rellevant en el cas del MJP. Basant-se en troballes anteriors (Wellenzohn i cols., 2016), s'esperava que totes les variants temporals foren efectives en l'augment del benestar i que produirien millors resultats que la condició control.

Per a realitzar tots dos estudis es van crear dues variants del MJP. La versió original demana als/les participants que escriguen i visualitzen el seu millor jo en el futur després d'haver-hi assolit tot el desitjat (King, 2001; Sheldon i Lyubomirsky, 2006). Amb aquestes instruccions com a punt de partida, es va manipular l'orientació temporal del MJP, generant dues noves variants: el Millor Jo Passat (MJPA), que consistia a recordar i visualitzar-se a si mateix/a en una època en la qual els/les participants consideraven que van mostrar la millor versió de si mateixos/es, i el Millor Jo Present (MJPRE), en la qual els/les participants es visualitzaren a si mateixos/es en el present, concretament, en la millor versió que oferien al món. Aquestes tres condicions experimentals (MJP, MJPA, i MJPRE) es van comparar amb una condició control que consistia a escriure i visualitzar les activitats realitzades durant les últimes 24 hores (Enrique, Bretón-López, Juana; Molinari, Baños, i Botella, 2017; Meevissen i cols., 2011; Sheldon i Lyubomirsky, 2006).

En els dos estudis els participants van ser assignats a l'atzar a una de les quatre condicions (MJPA, MJPRE, MJP o control) i se'ls va animar a practicar l'exercici durant set dies. L'Estudi 1 (N = 112) es va aplicar a una mostra d'estudiants universitaris amb un disseny mixt (el primer dia es va realitzar en el laboratori, i durant els dies següents els/les participants van practicar a través d'Internet), i l'Estudi 2 (N = 108) es va aplicar a la població general amb un disseny completament *online*.

La mesura de resultat principal en l'Estudi 1 va ser l'afecte positiu, avaluat a través de l'escala d'afecte positiu i negatiu (López-Gómez, Hervás, i Vázquez, 2015), i les mesures secundàries van incloure l'escala de felicitat (Fordyce, 1988), l'escala de la satisfacció temporal amb la vida (Carrillo, Etchemendy, i Baños, 2018), la nova escala general d'autoeficàcia (Chen, Gully, i Eden, 2001), el qüestionari d'orientació de vida -revisat, per a mesurar optimisme (Otero, Luengo, Romero, Gómez, i Castro, 1998), i una pregunta *ad-hoc* sobre la satisfacció amb un/a mateix/a.

En el cas de l'Estudi 2, l'avaluació es va adaptar a una intervenció breu a través d'Internet, preveient que les persones interessades no estarien interessades a participar en un estudi que no requerira contestar llargues bateries de qüestionaris. La mesura principal de resultat va ser l'afecte positiu avaluat a través d'una Escala Visual Anàloga (EVA), i les mesures secundàries van consistir en ítems d'escales originals utilitzades en l'Estudi 1, de manera que es va extraure un ítem per a cada constructe (SV passada, present i futura, autoeficàcia, i optimisme).

En els dos estudis es van realitzar ANOVAs per a analitzar els canvis pre-post intervenció entre les diferents condicions, i es van calcular les grandàries de l'efecte intragrup per a explorar la magnitud dels canvis pre-post intervenció produïts en cada condició.

Tots dos estudis van mostrar resultats similars, confirmant la primera hipòtesi plantejada: les ANOVAs van mostrar que l'afecte positiu, la felicitat,

l'autoeficàcia, l'optimisme, i la SV temporal van augmentar significativament i l'afecte negatiu va disminuir significativament després d'una setmana de pràctica en totes les variants temporals en l'Estudi 1. A més. La satisfacció amb un/a mateix/a va incrementar-se significativament en les condicions MJPRE i MJP. En l'Estudi 2, es van trobar els mateixos resultats excepte en el cas de l'optimisme. Les grandàries de l'efecte intragrup en l'Estudi 1 van assenyalar resultats significatius en les condicions experimentals, en contrast amb la condició de control, que no va mostrar cap grandària de l'efecte intragrup significatiu. En l'Estudi 2 va sorgir un patró similar, encara que la condició control va mostrar una grandària d'efecte significatiu en una de les variables.

D'altra banda, no es van trobar diferències entre les condicions experimentals i control, per la qual cosa no es va confirmar la segona hipòtesi sobre la superioritat de les condicions experimentals sobre la condició de control, atès que l'última també va produir augments en el benestar. Aquests resultats poden deure's a una activació d'informació positiva rellevant per a un/a mateix/a, la qual cosa s'havia proposat com un possible component comú a les IPP i a determinats grups control (Mongrain i Anselmo-Matthews, 2012) i a una possible falta de potència estadística per a trobar resultats significatius, ja que aquests són altament depenents de la grandària de la mostra. Les grandàries de l'efecte intragrup trobats suggereixen que és possible que amb una mostra més gran hagueren sorgit diferències significatives, ja que les grandàries de l'efecte no són directament depenents de la grandària mostral (Gerber i Malhotra, 2008; Kühberger, Fritz, i Scherndl, 2014).

Atès que aquest Capítol va incloure dos assajos controlats aleatoritzats que compartien el mateix disseny a excepció de les tecnologies utilitzades en la seua implementació, és possible comparar els resultats de tots dos estudis, encara que l'avaluació no va anar exactament equivalent (ja que l'Estudi 2 va reduir el nombre de preguntes per a disminuir la càrrega produïda per l'avaluació). L'elevada similitud en els resultats obtinguts en tots dos estudis suggereix que l'adaptació a un format *online* de les instruccions i la metodologia

va ser efectiva i que és factible implementar aquestes intervencions en forma d'IPPI.

En conclusió, aquest és el primer estudi que analitza el paper que té la temporalitat en l'eficàcia de la intervenció MJP. Els resultats suggereixen que la temporalitat no juga un paper significatiu en termes de l'eficàcia de la intervenció, ja que totes les variants van produir millores en les mesures de benestar, i que és possible implementar-les completament a través d'Internet.

Capítol 5. Anàlisi qualitativa del Millor Jo Possible: mecanismes subjacents que influeixen en la seua eficàcia.

En l'estudi contingut en el Capítol 5 es presenta una anàlisi del contingut dels textos del MJP i les seues variants temporals, amb la finalitat d'explorar les seues característiques i la seua relació amb l'eficàcia de les intervencions, atès que malgrat les proves sobre l'eficàcia de la intervenció MJP, poc se sap sobre com funciona aquesta activitat positiva (Carrillo, Rubio-Aparicio, i cols., 2018; Loveday i cols., 2016). Una de les opcions que pot ajudar a desentranyar els processos que tenen lloc en l'elaboració del MJP és l'anàlisi qualitativa dels textos, ja que aquesta intervenció requereix que els/les participants s'expressen per escrit en una redacció. No obstant això, fins avui solament dos estudis han analitzat el contingut dels textos dels participants que van practicar el MJP (Hill, Terrell, Arellano, Schuetz, i Nagoshi, 2015; Loveday, Lovell, i Jones, 2017), i tots dos sota models específics que no arreplegaven la totalitat del contingut, i en cap cas incloent la relació d'aquest contingut amb l'eficàcia de l'exercici en la millora del benestar.

Es van analitzar els textos de l'Estudi 1 (Capítol 4) de les condicions MJPA, MJPRE i MJP (després d'eliminar dos textos per no ajustar-se a les instruccions), per la qual cosa la mostra va estar composta per 79 participants (M = 20,23 DT = 4,10).

Les anàlisis dels textos es van dur a terme seguint el mètode consensuat de recerca qualitativa (Spangler, Liu, i Hill, 2012), i es van extraure els temes i característiques dels textos que arreplegaven les idees contingudes en les redaccions del MJPA, MJPRE, MJP. Per exemple, es van identificar temes com la família, la parella, l'àmbit professional/educatiu, o les característiques personals positives. Pel que fa a les característiques dels textos, es van arreplegar la valència emocional (el total d'estats emocionals positius menys el total d'estats emocionals negatius) o la longitud del text (nombre de paraules), entre altres. Els valors de Kappa van mostrar alts nivells d'acord.

La mesura d'eficàcia que es va prendre va ser la subescala d'afecte positiu de l'escala d'afecte positiu i negatiu (López-Gómez i cols., 2015), una de les mesures més utilitzades en estudis anteriors sobre el MJP (Loveday i cols., 2016), i la mesura principal de l'Estudi 1.

Per a analitzar les diferències entre condicions pel que fa al contingut i les característiques dels textos, es van realitzar MANOVAs, i per a analitzar si aquests predeien el canvi en l'afecte positiu es van realitzar anàlisi de regressió. Finalment, per a explorar si les característiques dels textos intervenien l'efecte del contingut sobre l'afecte positiu, es van dur a terme anàlisi de mediació.

Els resultats principals van mostrar que els/les participants de les diferents condicions van escriure sobre temes diferents quan van descriure el seu millor jo. Per exemple, els/les participants de la condició MJPRE van escriure amb major freqüència que la resta de participants sobre les seues característiques personals positives, i els qui van escriure sobre el seu MJPA van incloure més sovint les seues relacions d'amistat que en les altres dues condicions.

A més, les anàlisis de regressió també van llançar resultats dispars segons la condició: van revelar que la valència emocional dels textos predeia el canvi en l'afecte positiu en la condició MJPA, mentre que per a la condició MJP, eren la longitud del text i l'aparició del tema acadèmic/professional extrínsec el que

predeia el canvi en l'afecte positiu. En el cas de MJPRE, cap variable es va mantenir com predictor significatiu.

Finalment, les anàlisis de mediació també van mostrar resultats divergents segons la condició. En la condició MJPA, la valència emocional del text era mediadora dels efectes produïts en l'afecte positiu per escriure sobre amistat i parella, i en la condició MJP la longitud del text era mediadora dels efectes produïts per escriure sobre les pròpies característiques personals positives i la família. De nou, no es van trobar resultats significatius per a la condició MJPRE. Aquests resultats suggereixen que, quan els/les participants en la condició MJPA van escriure sobre els temes d'amistat i parella, van escriure textos més positius, la qual cosa va produir majors increments en l'afecte positiu. De la mateixa manera, quan els/les participants en condició de MJP van escriure sobre les seues característiques positives o la família, van escriure textos més llargs, la qual cosa va produir majors increments en l'afecte positiu.

Aquest estudi és el primer intent de combinar el contingut dels textos de les intervencions del MJP i la seua eficàcia per a augmentar l'afecte positiu i mostra que, malgrat els efectes similars trobats en el Capítol 4, aquestes intervencions responen a diferents mecanismes subjacents: hi ha diferències en el contingut i la forma de les composicions de les tres intervencions i, el més important, aquestes diferències semblen predir el canvi en l'afecte positiu.

Discussió

En conclusió, aquesta tesi contribueix al coneixement d'una IPP àmpliament utilitzada, i a respondre a les noves preguntes sobre com i per què funciona. Concretament, es van trobar els següents resultats:

- El MJP és una intervenció eficaç per a augmentar els nivells de benestar, l'afecte positiu i l'optimisme, i per a disminuir els símptomes depressius i l'afecte negatiu.

- La temporalitat és un factor rellevant en l'avaluació de la satisfacció amb la vida.

- No obstant això, la temporalitat no sembla afectar directament l'eficàcia de la intervenció del MJP.

- Les condicions control poden no ser tan innòcues com s'esperava, atès que produeixen beneficis en el benestar.

- Les TIC són recursos valuosos per a implementar la intervenció MJP i les seues variants temporals.

- Els mecanismes que subjauen a les diferents variants temporals del MJP són diferents.

Per a poder interpretar plenament les principals troballes d'aquesta tesi doctoral, és important també destacar les fortaleses i limitacions generals que presenta. Pel que fa a les fortaleses d'aquesta tesi, cal destacar que: (1) es compon de diferents estudis que han seguit estàndards metodològics elevats (per exemple, el metaanàlisi va seguir una metodologia rigorosa basada en totes les directrius PRISMA, i el Capítol 4 va incloure dos estudis controlats aleatoritzats amb càlcul a priori de la grandària de la mostra), (2) inclou el primer examen del paper de l'orientació temporal en l'eficàcia de la intervenció MJP, (3) els dos estudis del Capítol 4 tenen el mateix disseny i la seua única diferència és el nivell de presència de les TIC, la qual cosa permet replicar les seues troballes i comparar la viabilitat i eficàcia d'un disseny *online*, (4) aquest treball també inclou el primer estudi sobre els mecanismes que subjauen a l'eficàcia del MJP a través de l'anàlisi qualitativa dels textos.

Aquesta tesi no està exempta de les següents limitacions: (1) tot i que la grandària mínima de la mostra necessària es va calcular per als Estudis 1 i 2 en el Capítol 4, les dades suggereixen que la grandària mostral pot haver sigut insuficient, (2) les mostres incloses en els estudis del Capítol 4 són joves i es

componen d'estudiants universitaris i població general, deixant a un costat altres tipus de població vulnerable, la qual cosa limita la generalització dels seus resultats i la impossibilitat d'analitzar si ha pogut donar-se un "efecte sostre" en els mateixos, (3) el Capítol 4 no va incloure mesures de seguiment després de la intervenció, per la qual cosa no es van analitzar els efectes a llarg termini produïts per les intervencions, i (3) el Capítol 5 va ajudar en part a aclarir els processos que no es poden mesurar amb les dades quantitatives, però només va incloure els textos de l'Estudi 1 i una mesura quantitativa.

Aquest treball ha donat lloc a futures línies de recerca, que a més d'esmenar les limitacions prèviament esmentades, conviden a: (1) investigar altres factors relacionats amb l'eficàcia de la intervenció a més de la seua temporalitat, per exemple l'activació de contingut no directament associat a un/a mateix/a, (2) explorar a fons el que constitueix una condició control en Psicologia Positiva i per què en ocasions s'han trobat resultats positius en la millora del benestar (p. ex. King, 2001; Mongrain i Anselmo-Matthews, 2012; Seligman i cols., 2005), (3) analitzar els efectes de les intervencions utilitzades en aquesta tesi doctoral en mostres amb major heterogeneïtat en qüestió d'edat, per a explorar les possibles diferències que pogueren sorgir segons l'etapa vital dels/les participants, (4) implementar les intervencions en poblacions amb menors nivells d'afecte positiu (per exemple, poblacions subclíniques), per a explorar si es produeixen majors millores en comparació de la població general, (5) aplicar les intervencions a través d'aplicacions mòbils per a aprofitar al màxim els seus avantatges i afavorir la implicació dels/les participants en la seua pràctica diària, (6) provar els efectes de diferents combinacions de les variants del MJP, per a analitzar si la combinació de les variants en una intervenció més inclusiva és més efectiva per a augmentar el benestar, i si el desenvolupament de cada variant ajuda a construir les altres.

Finalment, cal esmentar que aquesta tesi ha donat lloc a nous projectes relacionats amb les línies futures assenyalades en aquesta discussió. Investigadors/es de la Universitat de València, la Universitat de Twente i l'Institut

Trimbos (Països Baixos) han estat treballant per a desenvolupar un nou projecte que té com a objectiu comprovar si la combinació de les intervencions incloses en aquest treball és més efectiva per a augmentar els nivells de benestar que la intervenció original del MJP, implementades a través d'aplicacions mòbils. Aquest treball està actualment en curs, i ja està aprovat pel comitè ètic de la Universitat de Twente (16337) i registrat en l'Institut Nacional de Registre Sanitari dels Estats Units (NCT03072680).

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Introduction

Introduction

Regardless of some pioneering works on the definition of wellbeing (e.g. Diener, 1984; Ryff, 1989) and how to increase its levels (e.g. Fordyce, 1977), the interest of the positive side of life did not flourish until the establishment of the Positive Psychology movement (Seligman & Csikszentmihalyi, 2000). Research about how to enhance wellbeing has grown exponentially since then, and one of the areas which has experienced a bigger development is the field of Positive Psychology Interventions (PPIs), aimed precisely at enhancing wellbeing levels of individuals who practice them (Mitchell, Vella-Brodrick, & Klein, 2010). Their efficacy has been analyzed in several meta-analyses, which have shown that PPIs are useful resources to achieve this objective (Bolier et al., 2013; Sin & Lyubomirsky, 2009). However, except for some recent reviews (e.g. Curry et al., 2018; Schutte & Malouff, 2018), the existing evidence about their efficacy includes a heterogeneous group of PPIs, which do not permit to know the specific effects produced by each intervention individually.

The field of PPIs has been complemented within the Information and Communication Technologies (ICTs): PPIs are now delivered through technologies, which make them more accessible, appealing and easy to use (Mitchell et al., 2010). There are already theoretical models (e.g. Calvo & Peters, 2013; Riva, Baños, Botella, Wiederhold, & Gaggioli, 2012) and empirical studies (e.g. Drozd, Mork, Nielsen, Raeder, & Bjørkli, 2014; Sergeant & Mongrain, 2015) which show that it is feasible to deliver PPIs through ICTs and that they can produce similar benefits with better levels of cost-effectiveness.

Lately, as a consequence of the exponential growth experienced by PPIs, novel questions are arising: why do PPIs work? although some authors have attempted to highlight some general models to explain their mechanisms, this question is still unanswered. Features as the characteristics of the individuals who practice the intervention as well as characteristics of the interventions themselves have been highlighted, although they need to be further explored (Lyubomirsky & Layous, 2013; Quoidbach, Mikolajczak, & Gross, 2015). However, these first

attempts have been directed towards all PPIs in general, hence it is still necessary to delve into the mechanisms that explain the efficacy of each intervention individually, in order to understand how they work and to make the most of them.

This dissertation will focus specifically in the Best Possible Self (BPS), which asks participants to write and envision their best possible self, imagining that the future turned out in the best way (King, 2001). It is one of the positive activities that has been most widely used in the field of PPIs, and it seems a promising approach to produce positive outcomes on wellbeing (Loveday, Lovell, & Jones, 2016). However, its overall efficacy is still understudied: although there are many individual published studies about its efficacy, it is still unknown what the overall efficacy of this intervention is, and further research is needed. Furthermore, as well as other PPIs, the factors that make this intervention individually effective are still uncertain.

Hence, the objective of this dissertation is to explore the overall efficacy of the BPS intervention and to analyze the mechanisms that can play a role in its efficacy.

To address these objectives, this dissertation will present several chapters. First, Chapter 1 will present a theoretical review of the background that surrounds this thesis: wellbeing, PPIs, ICTs, and the BPS intervention. Subsequently, the five studies carried out in this dissertation (distributed in four chapters) will be presented in "article format", given that they have been already submitted to scientific journals indexed in the Journal Citation Report (JCR). One of them is already published, and the rest of them are currently under review. Each of these chapters follows the same schema: abstract, theoretical introduction, objectives and hypotheses, methodology, results, and discussion.

Concretely, Chapter 2 (entitled "Efficacy of the Best Possible Self intervention: a systematic review and meta-analysis") aims at analyzing the overall efficacy of

the BPS intervention, and includes a systematic review and meta-analysis of the published studies that compare the efficacy of this PPI compared with controls.

Chapter 3 (entitled “Past, present, and future life satisfaction: the role of age, positive and negative mood”) focuses on temporality and wellbeing. Concretely it has two objectives. First, to validate the Spanish version of the Temporal Satisfaction with Life Scale (TSWLS, Pavot, Diener, & Suh, 1998) in a Spanish-speaking sample, a scale that will be used in the subsequent studies. In addition, it aims at exploring the relationship between the temporal satisfaction with life with other components of subjective wellbeing (i.e. positive and negative mood) and sociodemographic variables, given that the research about the temporal life satisfaction and its relationship with these variables is still scarce. This study is already published in the journal “Current Psychology”.

Then, Chapter 4 (entitled “My best self in the past, present or future: results of two Randomized Controlled Trials”) presents two Randomized Controlled Trials in which the role of the temporal factor of the BPS is analyzed. Concretely, it presents the design of two variants of the original intervention (Best Past Self and Best Present Self), and two studies which explore the efficacy of the resulting three versions of the BPS (past, present, and future) to enhance wellbeing. Both studies share the same design and objectives, and differ in the level of implementation of ICTs.

Subsequently, Chapter 5 (entitled “Qualitative analysis of the Best Possible Self intervention: underlying mechanisms that influence its efficacy”) describes a study with the aim to explore the mechanisms that take place in the elaboration of the best past, present and future selves and how these are related to their efficacy to improve positive affect.

In conclusion, this thesis presents novel research about the efficacy of one of the main PPIs used to increase wellbeing and advances in the questions about how this PPI work.

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1

Background

1. Positive Psychology Interventions and wellbeing

Wellbeing is a multifaceted concept without a single clearly accepted definition in psychology research, which has been traditionally conceptualized within two approaches: Subjective wellbeing (SWB) and Psychological wellbeing (PWB) (Mitchell, Vella-Brodrick, & Klein, 2010). SWB (Diener, 1984) is defined as the composite of positive and negative mood (affective component) and life satisfaction (cognitive component). Therefore, frequent positive emotions, low presence of negative emotions and a positive judgment about one's life are the main ingredients for a positive life experience. PWB (Ryff, 1989, 2013) focuses on the positive functioning or optimal developing of the individuals, including aspects as psychological growth, self-acceptance, positive relationships with others, environmental mastery, autonomy or life purpose.

Lately, some authors have developed integrated theoretical models of wellbeing that incorporate these two schools of thought, thus considering both SWB and PWB (Kashdan, Biswas-Diener, & King, 2008). For example, Seligman (2011) described happiness as the result of three pathways: pleasure, engagement, and meaning. In this model, pleasure refers to the presence of positive emotions, which can be about the past (e.g. pride), present (e.g. satisfaction from immediate pleasure), or future (e.g. optimism); engagement alludes to being completely immersed, for example, in a specific activity, with one's attention fully focused on it and using one's strengths; and meaning involves applying one's strengths to serve something greater than the self (e.g. contributing to society, helping one's family). According to the traditional distinction, pleasure could be equated to SWB, while engagement and meaning seem to align to PWB (Mitchell et al., 2010). Subsequently, he developed a wellbeing model in which these components were summed to positive relationships and achievement (accomplishment pursued for its own sake), becoming these five concepts the basic ingredients of wellbeing (Seligman, 2011).

Besides, Keyes (2002, 2006) illustrated wellbeing as a result of SWB, PWB, and social wellbeing. This latter construct was defined as the perceptions of the

individuals about the quality of their relationships with others and the community. Concretely, an individual who sees society as meaningful, understandable and with potential for growth, who feels he/she belongs to and is accepted by the community, who accepts most parts of society and feels he/she contributes to it, is an individual with high social wellbeing. If this individual, in addition, frequently feels positive emotions, is satisfied with his/her life and functions optimally (Ryff, 1989), said individual would be one who flourishes (Keyes, 2002).

Regardless of the first theoretical frameworks on wellbeing (e.g. Diener, 1984; Ryff, 1989) and some pioneering works aimed specifically at developing new ways to enhance happiness (e.g. Fordyce, 1977), the focus on the positive facets of life did not develop until the late 90s, with the official arrival of the Positive Psychology (PP) movement (Seligman & Csikszentmihalyi, 2000). From that moment onwards, the scientific attention about how to explain and foster people's wellbeing has been burgeoning. There is a wide range of evidence of the importance and benefits of promoting positive emotions and wellbeing, and even the World Health Organization (WHO) included it in their description of mental health, defined as the presence of a state of full physical, mental and social wellbeing, and not merely the absence of mental illness (WHO, 2001). In other words, to achieve mental health it is not sufficient to solely work towards the alleviation of symptoms, but it is also important to actively work towards wellbeing promotion and, thus, to investigate new approaches that help to enhance it.

One way to do so is by fostering positive emotions. Furthermore, as the "broaden-and-build theory" asserts (Fredrickson, 2001), the promotion of positive emotions is not only a valuable purpose itself, but also a means to an optimal functioning in the long term. Contrary to the effects produced by negative emotions, which constrain cognitions and prompt specific repertoires of action in order to help the individual to manage an adverse situation (e.g. to focus the attention on a dangerous stimulus and to prepare the body for the fight

response), positive emotions, even phenomenologically different ones (e.g. joy or love), are all able to broaden the momentary repertoires of thought and action and to build long-lasting personal resources. For example, joy broadens creativity in different contexts, contentment creates the urge to savor the current moment, and interest promotes exploring and taking new information. All these reactions are different samples in which positive emotions broaden the usual modes of thinking or acting by an individual, which may in turn help to build personal resources in the long term (e.g. psychological resilience or closer relationships) (Fredrickson, 2001).

In response to the contemporary rise in the interest of wellbeing, Positive Psychology Interventions (PPIs) emerged as promising resources that could help people flourish. Research on this topic has spread with the objective of designing these interventions, exercises or therapies, which aim to increase people's wellbeing by cultivating positive feelings, cognitions or behaviors (Bolier et al., 2013; Mitchell et al., 2010; Sin & Lyubomirsky, 2009), and to examine their efficacy.

By their definition, one can infer that interventions primarily aimed at lessening patients' suffering or reducing psychopathology would not be considered PPIs: the key factor of this type of interventions is the specific focus on directly cultivating positive functioning and wellbeing, opposed to focusing on the alleviation of symptomatology. Parks & Biswas-Diener (2013) went further and considered three criteria to determine which interventions could be categorized as PPIs. Firstly, the main aim of the intervention must be to build a positive variable (or variables), as SWB or a specific positive emotion. Secondly, there should be empirical evidence that the intervention is able to manipulate the target variable(s), in short, the activity must be evidence-based. Thirdly, there must be empirical evidence that the enhancement of the target variable produces benefits to the assigned population, hence the target variable should, in addition, have an empirical basis. These criteria permit differentiation of PPIs from other types of activities, as self-help approaches that lack empirical

foundation, or interventions targeted at increasing positive variables inappropriately as it could be, for example, a gratitude intervention for recent trauma victims (Parks & Biswas-Diener, 2013).

Under the umbrella of PPIs, a plethora of approaches have been followed in order to cultivate diverse positive emotions through simple activities which are easy to implement and do not require long training sessions or specific abilities of the participants. Although all PPIs share the same aim (i.e. to promote wellbeing), the means used to achieve this goal are highly heterogeneous. Numerous and diverse evaluation studies have been carried out on the capability of different PPIs to enhance wellbeing through different procedures, generally showing increases in the levels of diverse wellbeing variables comparing with control conditions. It is possible to organize PPIs regarding the temporal frame in which participants are asked to focus on, being categorized as PPIs related to the past, present or future (Smith, Harrison, Kurtz, & Bryant, 2014). Regarding past-focused PPIs, some examples asked participants to write down positive past experiences including sensory details and feelings (Baikie, Geerligs, & Wilhelm, 2012; Burton & King, 2004) or to write letters of gratitude appreciating something positive someone did in the past for which participants were grateful for (Boehm, Lyubomirsky, & Sheldon, 2011; Seligman, Steen, Park, & Peterson, 2005). The case of present-focused PPIs can be represented, for example, by interventions that promote performing daily acts of kindness as doing something kind for a person in one's social network (Alden & Trew, 2013; O'Connell, O'Shea, & Gallagher, 2016) or encouraging individuals to savor the moment by asking participants to focus on the positive events as they occur in order to increase, intensify or prolong positive emotions in the present moment (Hurley & Kwon, 2012). Future-oriented PPIs include interventions that rely on a prospection of an imagined future, as asking participants to imagine positive events that could happen in the near future (Quoidbach, Wood, & Hansenne, 2009) or to imagine oneself in the best possible future, after everything desired has been achieved (King, 2001).

In addition, there are programs that combine different interventions, in which not only a single specific exercise is used, but a combination of PPIs that can be highly heterogeneous. Some examples are the Working for Wellness Program, an intervention delivered to employees that included components such as using one's strengths, fostering relationships with colleagues, setting goals, or getting into flow at work (Page & Vella-Brodrick, 2013), the Bite Back online program, in which a webpage was developed to train nine domains of PP (gratitude, optimism, flow, and meaning, among others) to promote mental health over youth (Manicavasagar et al., 2014), or the Happy despite Pain program, designed to be applied to chronic pain patients that included PPIs aimed at increasing gratitude, savoring or optimism (Flink, Smeets, Bergbom, & Peters, 2015). Interestingly, this approach can be more representative of what participants actually seek, as people usually practice more than one or two interventions in the same period of time (Parks, Della Porta, Pierce, Zilca, & Lyubomirsky, 2012). Notwithstanding, their design does not allow elucidation in regard to a specific component (or components) producing the observed effects, hence the unique contributions each intervention makes within the whole program remains unclear.

To date, two meta-analyses have been performed about the efficacy of PPIs on wellbeing enhancement (Bolier et al., 2013; Sin & Lyubomirsky, 2009). Explicitly, the last meta-analysis describing 39 studies showed that PPIs are efficacious interventions in increasing subjective and psychological wellbeing with small to moderate effect sizes (Bolier et al., 2013). However, the quality of studies was rated as poor and risk of publication bias was found. As the authors state, a need still exists to continue conducting high-quality randomized-controlled trials that will allow researchers to reach more robust conclusions about the efficacy of PPIs, and to publish studies even with small samples or when no effects are found, in order to reduce publication bias in the field of Positive Psychology.

It is noteworthy that the results derived from both previously mentioned meta-analyses included a wide range of PPIs as diverse as activities aimed at

promoting gratitude, optimism, or kindness, interventions as positive psychotherapy, mindfulness or hope therapy, as well as diverse comprehensive PPI programs, thus their results cannot be attributed to specific interventions but to PPIs on the whole. For this reason, it is necessary to carry out further meta-analyses on specific PPIs to complement these results (Bolier et al., 2013).

As a response to this need, interest in these type of reviews is growing, and some systematic reviews and meta-analyses about specific interventions have been recently published about PPIs as performing acts of kindness (Curry et al., 2018), using signature strengths (Schutte & Malouff, 2018), or gratitude interventions (Davis et al., 2016; Dickens, 2017). Nevertheless, there is still only a handful of reviews, and more research is needed in this area in order to shed light on the overall effects of other specific types of interventions.

2. Why do PPIs work?

Considering the body of evidence that already exists about PPIs, it can be concluded that these interventions are valuable means for the promotion of the good life, which could act as accessible resources to foster wellbeing on the general population. Lately, as a consequence of the progression in the knowledge of these interventions, and after almost two decades since the arrival of the PP movement, a new question has arisen: why do PPIs work? In other words, what are the mechanisms that make them efficacious to increase wellbeing levels? Although this question is still unanswered, some first attempts have been made in order to advance in this matter.

On the one hand, Quoidbach, Mikolajczak and Gross (2015) proposed a framework to integrate the findings of PPIs within the model of emotion regulation of Gross (1998), which refers to the process in which the individual influences his/her emotions. In this framework, the authors organize the different efforts to upregulate positive emotions attending to the underlying psychological processes that take place and the temporal frame in which they are used. These

processes are the strategies used by individuals to regulate their (positive) emotions. The proposed strategies are "situation selection" (i.e. select a situation depending on the expected emotional consequences that it will generate), "situation modification" (i.e. modify the current situation, for example to maximize the likelihood of positive emotions), "attentional deployment" (i.e. shift one's attention to the positive side of the experience), "cognitive change" (i.e. reframe the meaning of the situation), and "response modulation" (i.e. modify one's response to the situation). These strategies are organized within a temporal framework, depending on the moment in which they are displayed: either before an event (through *anticipating*), during the event (through *experiencing*), and after the event (through *reminiscing*). Following the rationale of the authors, one of the components of PPIs are the positive emotion-inducing strategies, thus PPIs can be organized depending on the strategies that are activated when practicing them, and the moment in which they take place regarding the specific situation. For example, BPS would be framed as attentional deployment before an event (through *anticipating*), gratitude interventions would be categorized within the cognitive change and response modulation after an event (through *reminiscing*) and savoring the moment interventions within the attentional deployment strategy during the event (through *experiencing*). It is worth to note, however, that the process of savoring might take place in the face of other PPIs and not only through savoring interventions that are explicitly designed to prompt it. Savoring is defined as the ability to regulate the emotional impact of positive events through one's thoughts and behaviors, and it takes place in many day-to-day situations and relies on one's ability to use this personal resource (Bryant & Veroff, 2007; Smith et al., 2014). This can be achieved either through *reminiscing* (recalling past experiences in order to generate positive emotions), *experiencing* (focusing on current positive experiences in the present moment to strengthen or lengthen the positive emotions through specific thoughts or behaviors), or *anticipating* (imagining future positive experiences to generate positive emotions in the present) (Bryant, 2003; Bryant & Veroff, 2007; Smith et

al., 2014). Thus, it could be applied also within the practice of other types of PPIs that are not necessarily present-focused (Wellenzohn, Proyer, & Ruch, 2016).

On the other hand, theories of person-activity fit shift the focus of attention from the interventions themselves to the interaction between these and the characteristics of the individuals who practice them: they assume that the different PPIs that exist will be more beneficial to some individuals than to others, based on the characteristics of both (Lyubomirsky & Layous, 2013; Schueller, 2014). Concretely, they emphasize the importance of the features of the PPI, the characteristics of the individual who practices it, and, most importantly, the influence that the "fit" between both have on the effects on wellbeing obtained by the PPIs. That is, albeit both the intervention and the individual features can influence the effects obtained by the PPI, these theories outline the importance that the interaction between both types of features has on the overall effects obtained. Lyubomirsky and Layous (2013) combined this theoretical framework and the existing evidence from previous studies to develop the positive-activity model, in which they proposed several features of the individuals that will more likely promote durable wellbeing if they are combined with some characteristics of the positive activity itself.

Examples of the features of the users of PPIs are one's motivation to engage in the activity (e.g. participants who deliberately choose to engage in a positive activity to enhance their happiness levels), their effort to perform it, personality traits, social support, demographic characteristics (e.g. age, culture of origin) and one's affective state at baseline (e.g. levels of positive or negative affect, presence of depressive symptoms).

As regards the features of the interventions, the positive-activity model proposes two types: the ones that can be applied to any PPI, and the ones that differentiate one PPI from another. The first ones are the dosage (e.g. practice the activity once a week or once per day), the variety (e.g. practicing only one type of intervention or a combination), the sequence of practice (e.g. which is the initial activity in a comprehensive package of PPIs), and the social support received

for the practice have been proposed as important agents in this model. Regarding the features that permit to differentiate among PPIs, several factors have been proposed. First, the social orientation of the activity, that is, if they are other-oriented (such as performing acts of kindness) or self-oriented (such as practicing optimistic thinking). Second, the cognitive-behavioral nature of the activity, which means whether the activity proposed is social-behavioral (e.g. being kind) or reflective-cognitive (e.g. savoring). And third, its temporality, that is, the focus of the specific PPI regarding the temporal frame. For example, activities focused on the past such as gratitude interventions, in the present such as savoring the moment or in the future as visualizing one's best possible self. Comparing with research on the moderator variables related to the individuals who engage in positive activities, the study of the idiosyncratic characteristics of the PPIs themselves has received less attention.

Research interest on these features is increasing, and, in this sense, empirical studies that include personal variables as possible moderators of the efficacy of different PPIs are exponentially growing, which include the features proposed by the positive-activity model and other personal variables such as mindfulness and other self-regulatory strategies (e.g. Antoine, Dauvier, Andreotti, & Congard, 2018; Harbaugh & Vasey, 2014; Lyubomirsky & Layous, 2013; Proyer, Gander, Wellenzohn, & Ruch, 2016a; Proyer, Wellenzohn, Gander, & Ruch, 2015; Seear & Vella-Brodrick, 2013). It is worth mentioning, however, that not all studies have found evidence of the previously proposed features. A recent work by Wang and colleagues (Wang et al., 2017), analyzed the role of 15 possible moderators based in the person-activity theories in an online study, in which 884 adolescents were asked to write gratitude letters and perform acts of kindness during several weeks. Variables related to the users (sociodemographic factors, personality traits, baseline characteristics, etcetera) and common features of the interventions (number of activities, continuation of the practice after the assigned period of time, the fit between personal preferences and the assigned exercise, and so on) were assessed. Interestingly, moderation analyses showed null results on all variables. Even that the lack of significance can be considered as

a positive result (as it seems that all participants may benefit from the interventions), there is a remaining variation that still needs to be explored, maybe considering other sources of moderation (Wang et al., 2017).

Regarding the features of the PPIs that differentiate from one another, only a few studies have been published. One example is the work by Wellenzohn and colleagues (Proyer, Gander, Wellenzohn, & Ruch, 2016b), which considered the temporality of the PPIs a key factor for its efficacy. They manipulated the temporality of a humor-based intervention and found similar benefits through the different time frames, although the underlying mechanisms that lied beneath them were different. Another relevant study is the one by Mongrain and Anselmo-Matthews (2012). In this study, a control condition was explicitly manipulated to be paired with other PPIs previously validated by Seligman and colleagues (Seligman et al., 2005), and found no differences among these conditions. After these results, the authors proposed that one of the main elements of the PPIs that may produce benefits is the activation of positive information relevant to the self.

As it can be seen, the aforementioned theoretical models and related empirical studies expound the influence that several important variables can have on the efficacy of PPIs in general, which can be used to foster their efficacy and make the most of them. Be that as it may, research about why and how positive activities work is still in its early stages and needs to be further explored, thus the question about why do PPIs work still remains unclear (Bolier et al., 2013; Lyubomirsky & Layous, 2013; Mongrain & Anselmo-Matthews, 2012; Wang et al., 2017). In addition, these initial attempts to identify the conditions under which PPIs obtain the best outcomes and the processes by which they work have been mainly applied to the whole range of PPIs and have considered primarily the moderator factors of the individuals, thus they do not clarify what are the precise mechanisms that underlie and explain why and how a specific PPI works. Hence, there is still a lack of knowledge about what are the factors that make each PPI individually efficacious.

3. PPIs and Information and Communication Technologies

PP has been developed along with the growth of the digital era and both advances have not been independent: even since its inception, PP has been connected to the field of Information and Communication Technologies (ICTs). A reflection of this interaction is one of the first studies that tested the efficacy of different PPIs (Seligman et al., 2005), which recruited participants through advertisements in a well-publicized website (*Authentic Happiness*).

In 2018, Internet users have increased to 54.4% of the world population, being especially high in Europe (85.2%) and North America (95%; Internet World Stats, 2018). In the same vein, about 59% of the global population reported owning a smartphone in 2017 (Pew Global, 2018). These statistics confirm how present technologies are in our daily lives. Individuals use their laptops, tablets or smartphones many times a day to read the news, scroll through the feeds on their social media page or check their e-mail account. Notably, the advancement that ICTs have experienced does not only affect one's day to day routines, but it has also influenced the interventions that psychology researchers and practitioners are developing.

As the definition of PP itself suggests, it is time to work towards the flourishment of people, and ICTs can certainly support this endeavor. Going further, Seligman (2011) outlined a grand (and challenging) long-term mission for PP: to ensure that 51% of the population will be flourishing by the year 2051. This challenge can be achieved if many efforts are afforded, as positive education or positive businesses, but most crucially (although not solely) by positive computing (Seligman, 2011).

The term "positive computing" was described as the design and development of technology with the aim to support psychological wellbeing and human potential (Calvo & Peters, 2013). Another close concept is the term "positive technologies" (Botella et al., 2012; Riva, Baños, Botella, Wiederhold, & Gaggioli, 2012), which refers to the evidence-based approach that studies the use of

technology with the aim to improve the quality of personal experiences. This approach intends to encourage the use of technology to promote personal growth and the development of the virtues and strengths of individuals, organizations, and society. Both terms, positive computing and positive technologies, help to conceptualize this promising alliance: the association between ICTs and PP. To join both fields can produce major advances in the promotion of wellbeing of the individuals: ICTs have the ability to reach people all over the world and to deliver resources adapted to the target populations, which would be impossible for PPIs without these valuable means.

This association led to the development of the Online Positive Psychology Interventions (OPPIs). These are derived from the Internet psychological interventions, which are typically behavioral treatments delivered through the Internet in a multimedia format, usually self-paced and interactive, and whose aim is to change behaviors and reduce symptomatology (Ritterband et al., 2003). Delivering PPIs through the Internet has several advantages: accessibility (Internet is available at any time and from many places), cost-effectiveness (e.g. saves time for therapists), personalization (e.g. contents can be tailored depending on the profile of the individuals or their responses), multi-media options (videos, pictures, etcetera can enrich or substitute text-based programs), consumer empowerment (users take an active role in their participation or engagement, and can direct their own learning process), and anonymity, among others (see Mitchell et al., 2010).

As aforementioned, the use of the Internet has spread during the last number of years, but a rapid revolution has taken place within the field of smartphones, resulting in many individuals using their phones as they would have used their computers ten years ago. Nowadays, the entire world is within one's reach, through a small handheld device. As a consequence, many of these OPPIs are delivered through these devices in the form of specific smartphone applications (apps). These stem from both the "mHealth interventions" and "ecological momentary interventions" (EMIs). The former ones are defined as psychological

or mental health interventions delivered or supported by the use of mobile phone technology, with the objective to improve treatment and assessment, facilitate the dissemination of interventions and to deliver therapists and clients with treatment materials (Clough & Casey, 2015), while EMIs refer to interventions implemented through mobile phones in real time (that is, in the individual's daily life) (Versluis, Verkuil, Spinhoven, Van Der Ploeg, & Brosschot, 2016). Providing PPIs through mobile phones have similar advantages than OPPIs and include, in addition, different sensors and capabilities such as messaging, making phone calls, taking pictures and more. Consequently, they can be extremely useful tools for delivering interventions naturally as part of the participants' routine, given their high ubiquity and the innovative resources they offer, making the intervention more attractive and flexible.

All those advantages are already being used by practitioners to design and develop even more accessible interventions, and different studies have been carried out in order to design and validate OPPIs through the Internet and through mobile phones (given the similarity of the approaches followed by OPPIs and PPIs delivered through mobile phones, both concepts are referred as OPPIs in this work). There are already numerous studies about OPPIs delivered through the Internet (e.g. Drozd, Mork, Nielsen, Raeder, & Bjørkli, 2014; Proyer, Gander, Wellenzohn, & Ruch, 2016; Sergeant & Mongrain, 2015) or in the form of mobile apps (e.g. Daugherty et al., 2018), showing that it is feasible to deliver PPIs through technologies, therefore the benefits of PPIs can be maximized.

Due to this, OPPIs should not just be the translation of a PPI into a web or app format, but they should take advantage of the many innovative developments of the ICTs. Thus their design should consider ICTs since the inception of the intervention, and not only on the delivery method (Parks, 2014). One of the most important limitations of OPPIs is the high attrition rates found in some studies, which justifies a good design of the OPPIs in order to make them attractive for users, and to consider within the design the factors that influence a participant engagement (Parks, 2014; Walsh, Kaselionyte, Taylor, & Priebe, 2018). In

addition, given the rapid expansion of OPPIs (especially, mobile apps), there is a need to act with caution and check the quality of the OPPIs before making use of them, as some may lack empirical evidence (Stoyanov et al., 2015).

In conclusion, ICTs are not the future anymore, but they already belong to the present moment. Although they must be used with caution and it is necessary to continue investigating its applications and effects, they already constitute a resource that has shown promising results in the field of PP. Researchers should take advantage of this resource, as the combination of both areas (ICTs and PP) can have a great impact on society's wellbeing.

4. The case of the Best Possible Self intervention

The Best Possible Self intervention (BPS) is one of the most widely used PPIs, with more than 30 studies published about its efficacy (Loveday, Lovell, & Jones, 2016). As briefly mentioned above, when practicing this activity, participants were asked to write about themselves in the best possible future, after everything desired was obtained. The first instructions used to apply the exercise were the ones provided by King (2001): "*Think about your life in the future. Imagine that everything has gone as well as it possibly could. You have worked hard and succeeded at accomplishing all of your life goals. Think of this as the realization of all of your life dreams. Now, write about what you imagined*." In addition, one of the most cited instructions, which were in turn based on the work by King (2001, p. 801), are the ones used by Sheldon & Lyubomirsky (2006, pp. 76-77): "*(…) imagine yourself in the future, after everything has gone as well as it possibly could. You have worked hard and succeeded at accomplishing all of your life goals. Think of this as the realization of your life dreams, and of your own best potentials. In all of these cases you are identifying the best possible way that things might turn out in your life, in order to help guide your decisions now. You may not have thought about yourself in this way before, but research suggests that doing so can have a strong positive effect on your mood and life*

satisfaction. So, we'd like to ask you to continue thinking in this way over the next few weeks, following up on the initial writing that you're about to do." As it can be deduced in these instructions, this activity aims at promoting a positive outlook of oneself in the future and asks participants to write down this mental image in the form of a structured essay.

This exercise was developed by King (2001) as a first attempt to compare positive and negative writing paradigms, assessing the effects of this exercise and the ones obtained by writing about a traumatic event, based on the writing paradigm of Pennebaker (1997). This study intended to gain a response to the following question: is it necessary to write about a traumatic or negative event in order to find the benefits to health previously found within the trauma paradigm, or is it possible to produce them through less upsetting writing topics? Based on previous findings, the author suggested that the benefits of writing might be tied to constructing a sensible story driven by insight rather than writing about a previously undisclosed negative emotion. Thus, she hypothesized that any self-regulatory topic (even temporarily different) might produce similar health benefits as the trauma-writing paradigm. The procedure involved participants that either wrote about aspects of their BPS, their most traumatic event, or what they would do the next day (neutral topic). Participants were randomized to one of these conditions and wrote about the assigned topic for 20 minutes over four days. Measures of affect were taken prior to and after each writing session. Wellbeing levels (as a composite of life satisfaction and optimism) were measured after four weeks, and health center visits made for illness before the intervention and after five months were checked. Results showed that both disclosive writing and BPS were beneficial for physical health with fewer illness visits than controls, and BPS showed significant increases in wellbeing. Interestingly, participants in the BPS condition rated the exercise as significantly less upsetting than participants in the trauma writing condition. Results from this first study go in line with the last meta-analysis about disclosive writing, in which no significant differences between disclosing negative events and writing about positive events were found on psychological and health benefits (Frattaroli,

2006). Following the perspective of the author of this review, positive writing interventions could be conceptualized as more advantageous, since they seem to produce similar benefits as trauma writing, without the increases in negative affect that usually accompany the trauma paradigm.

From 2001 to the current moment, a large number of studies have been conducted to assess the efficacy of this intervention on different wellbeing outcomes. Some other studies compared writing about one's BPS and writing about trauma. Austenfeld and colleagues (Austenfeld, Paolo, & Stanton, 2006; Austenfeld & Stanton, 2008) found that BPS produced lower levels of health center visits and decreases in hostility compared to control and trauma conditions. Yogo and Fujihara (2008) found that BPS condition reported decreases in negative mood and physical symptoms, with opposite results found for the trauma writing condition.

However, after the emergence of the PP movement, interest in the benefits of the BPS exercise gradually migrated to the wellbeing promotion, and as a result, the interest in the disclosive writing paradigm and symptoms' alleviation (e.g. health center visits) decreased in the BPS studies. Therefore, trauma writing conditions are no longer the focus of attention within the BPS paradigm. Instead, comparison groups are usually neutral topic writing groups that consist of writing about the activities done during the last 24 hours or the activities planned for the next day.

It is worth to note that BPS exercise has been used in diverse contexts and with different specific aims. The majority of studies used the intervention as a way to promote wellbeing over participants, being applied through the Internet with a completely online format (Layous et al., 2013; Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011), while others applied it in person, either individually (e.g. Enrique, Bretón-López, Molinari, Baños, & Botella, 2017; Ng, 2016), or within small groups (e.g. Sheldon & Lyubomirsky, 2006). The exercise has also been used as an optimism inductor in laboratory tasks (e.g. Boselie, Vancleef, & Peters, 2016; Manthey, Vehreschild, & Renner, 2016). Studies have found that

BPS, compared to neutral topic conditions, produces significant increases in positive affect and decreases in negative affect (e.g. Harrist, Carlozzi, McGovern, & Harrist, 2007; Meevissen, Peters, & Alberts, 2011), increases in life satisfaction (e.g. Boehm et al., 2011; Liau, Neihart, Teo, & Lo, 2016), happiness (Ng, 2016), wellbeing (Odou & Vella-Brodrick, 2013) and optimism (e.g. Boselie, Vancleef, & Peters, 2017; Hanssen, Peters, Vlaeyen, Meevissen, & Vancleef, 2013).

The previously discussed intervention is usually defined as a visualization exercise (e.g. King, 2001), as one needs to picture oneself in the best possible future in order to be able to write the assigned essay. It is suggested that imagery can produce benefits in emotional processing, as there is empirical evidence of more powerful effects on emotion processing when imagery is used, compared to exclusively writing or talking (Holmes, Arntz, & Smucker, 2007). For this reason, it is possible that the use of imagery may produce better outcomes than simply writing about an emotional topic. In many published studies, an imagery component was not explicitly included, ergo this element relied on the interest and ability of each participant. However, some authors added a specific visualization ingredient to the original BPS intervention. One such example, Odou & Vella-Brodrick (2013) prompted participants to use as many sensory modalities as possible (i.e. sight, taste, smell, sound, touch, feeling/emotion and sense of movement) and to close their eyes before they started to write their essay. Other authors included a brief imagery training (consisting of imagining cutting a lemon) and a specific period of time that should be dedicated to visualizing the content of the BPS essay (e.g. Enrique et al., 2017; Meevissen et al., 2011). As a result, the initial positive writing paradigm designed by King (2001) was supplemented with mental imagery.

As it can be seen, BPS is a complex PPI that requires participants to write about and picture themselves within a positive outlook, and it has experienced an exponential growth since its inception. Along the different published studies, it is possible to observe that BPS seems an efficacious intervention to enhance

wellbeing of the participants engaged in the activity. However, this conclusion can be only derived from the analysis of the individual studies, as there is only a qualitative review of this intervention (Loveday et al., 2016). In addition, the same question that concerns other PPI also surrounds this intervention: it is unknown which characteristics make this intervention effective and whether there are specific factors that may underpin its effectiveness. Hence, it is still necessary to continue exploring the overall efficacy of this intervention and its idiosyncratic characteristics.

5. Outline of this dissertation

As previously mentioned, PPIs can be valuable resources to promote SWB in individuals, and in this context, BPS seems to be a promising approach to produce positive outcomes on the participants who perform this writing exercise. Although there are many individual published studies about its efficacy, it is still unknown what the overall efficacy of this intervention is, and further research is needed on this issue. In addition, research on the mechanisms which lie beneath the efficacy of this positive activity is scarce. Along with this chapter, temporality emerged as a relevant factor worth to be further explored. Even the theoretical models developed to shed light on the functioning of PPIs coincide in the importance that temporality may have to disentangle how PPIs work. However, it is uncertain which role the future frame plays in the BPS intervention.

Therefore, the aim of this dissertation is twofold: to explore the overall efficacy of the BPS, and to analyze the role of the mechanisms that can influence its efficacy. Concretely, the role of the temporal focus will be examined.

Concretely, this dissertation has the following specific objectives:

1) To review the overall efficacy of the BPS intervention based on the existing evidence, and to explore the role of the possible moderator variables related to the intervention implementation.

2) To contribute to a more accurate measurement of SWB considering the temporal frame.

3) To design and develop two temporal variants of the original BPS (Best Past Self and Best Present Self), applied through ICTs.

4) To analyze the efficacy of the three temporal versions of BPS, applied through ICTs, to increase wellbeing.

5) To analyze the possible underlying mechanisms that lie beneath their effectiveness, through qualitative analyses of the texts.

This dissertation is composed of 5 studies (published in 4 papers) and two additional chapters aimed at addressing the previously mentioned objectives. Chapter 1 described a general introduction of the main topics of this dissertation, including the main characteristics and effects of PPIs and the BPS intervention. In addition, the role of possible factors that can influence the efficacy of these interventions was briefly exposed, as well as the impact that ICTs can have in the field of PPIs.

Chapter 2 consists of a systematic review and meta-analysis on the efficacy of the BPS compared with controls, which include the general efficacy levels of the intervention as well as the analyses of possible moderator variables.

Chapter 3 is aimed at describing the Spanish validation of a scale that measures life satisfaction along the lifespan. In addition, exploring the temporal aspects of SWB and its relationship with sociodemographic variables and the affective components of SWB.

Chapter 4 includes two randomized controlled trials (Study 1 and Study 2) in which the efficacy of the temporal variations of the BPS implemented through ICTs were compared with a control condition.

Chapter 5 includes a mixed method design in which a qualitative analysis of the texts included in Study 1 was carried out and combined with quantitative data about the efficacy of the intervention on positive affect.

Finally, Chapter 6 presents a general discussion that includes a summary of the main conclusions outlined by the results obtained in the previous publications, as well as the limitations and future directions of this dissertation.

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2

Efficacy of the Best Possible Self intervention: a systematic review and meta-analysis

This chapter is currently under review as Carrillo, A., Rubio-Aparicio, M., Molinari, G., Enrique, A., Sánchez-Meca, J., Baños, R. M. Efficacy of the Best Possible Self intervention: a systematic review and meta-analysis.

Abstract

Best Possible Self exercise (BPS) is one of the most widely used Positive Psychology Interventions which promotes a positive outlook of oneself in the best possible future, after working hard towards it. Since the first work which attempted to study the benefits of this intervention in 2001, studies about BPS have grown exponentially. However, still little is known about its overall effectiveness to increase wellbeing outcomes. Thus, the aim of this meta-analysis is to shed light on this question. The included 28 studies (in 25 articles) empirically tested the intervention compared with controls, either in one single-session design or a longer intervention. In addition, BPS was compared with gratitude interventions included in some of the studies. A total of 2,863 participants were involved in the analyses. Results showed that BPS is an efficacious intervention to improve wellbeing as one single-session (d_+ = 0.291) and as a larger intervention (d_+ = 0.381), optimism (single session d_+ = 0.378, intervention d_+ = 0.278), positive affect (single session d_+ = 0.339, intervention d_+ = 0.657), and to decrease negative affect and depressive symptoms as larger interventions (d_+ = 0.411 and d_+ = 0.115, respectively). Moderator analyses on wellbeing only showed a trend towards significance for age (years and standard deviation) and magnitude (total minutes of practice). BPS also showed to be more efficacious than gratitude interventions on positive affect (d_+ = 0.326) and negative affect (d_+ = 0.485). These results indicate that BPS can be considered as a valuable Positive Psychology Intervention to improve clients' wellbeing, which seems to be more efficacious for older participants and in more age-diversified samples, and to produce stronger effects as a shorter intervention (fewer days and less minutes of practice).

1. Introduction

Since the beginning of the Positive Psychology movement, research on positive functioning and wellbeing has grown exponentially [1]. Many efforts have been made in order to develop and validate different Positive Psychology Interventions (PPIs), defined as interventions or intentional activities whose aim is to cultivate positive feelings, cognitions and behaviors [2]. Several meta-analyses [2,3] showed that these interventions are, in general, effective in increasing wellbeing levels and decreasing depressive symptoms. Concretely, the last meta-analysis of PPIs [3] revealed small effect sizes for wellbeing (d = 0.34 for subjective wellbeing and d = 0.20 for psychological wellbeing). These reviews shed light on the field and provided very relevant data about the effectiveness of PPIs, but they include a wide range of interventions. Even that these interventions share the same aim, they are considerably heterogeneous in their specific target (e.g. interventions that promote optimism, gratitude, social connectedness, etc.), form (e.g. writing a gratitude letter or savoring the moment), and dosage (e.g. one single-session or a 1-month program), and they are delivered through different procedures (e.g. individual or group, face-to-face or online). Therefore, their analyses and conclusions are considerably general and do not supply specific information about the effectiveness of a particular PPI. In this case, further and more precise reviews are needed in order to complement their results.

One PPI that has been widely used is the “Best Possible Self” (BPS) intervention, which consists in writing about one’s best possible self in the future after everything has gone as good as it possibly could. The first study that used this paradigm compared its effectiveness versus a disclosive writing condition about a traumatic event [4]. Results indicated that BPS showed significant improvements in wellbeing at posttest, and it was rated as less upsetting compared to a trauma-writing exercise. Since the publication of this work, many studies about BPS have been carried out, with different approaches and delivery methods [5,6].

As a consequence of the exponential number of studies about BPS, some reviews were carried out. A recent meta-analysis about the efficacy of interventions intended to increase optimism evidenced a significant effect size of g = .41 of experimental conditions compared to controls on optimism levels [6]. This revision included any intervention whose aim was to improve optimism levels, comprising not only BPS studies but also other interventions. Moderator analyses showed that BPS was more efficacious (g = .64) than other interventions (g = .28), in increasing optimism levels. However, this revision only addressed optimism as the outcome variable and, therefore, it exclusively analyzed BPS studies that measured optimism (n = 10). Recently, a qualitative review of BPS interventions [5] concluded that BPS is a recommended intervention to improve wellbeing which is flexible in its delivery (online or face-to-face) and implementation (e.g. written or spoken). However, no quantitative analyses were carried out about the efficacy of the intervention, nor an evaluation of the quality of the studies. Therefore, after almost two decades since the first study about BPS, little is known about the overall effectiveness of this intervention on wellbeing, and a quantitative and systematic approach is needed in order to shed light on the efficacy of the intervention and to analyze potential moderators that can influence its effectiveness.

Consequently, the aim of the present study is to conduct a meta-analysis of the effectiveness of the BPS intervention on wellbeing, compared to controls. Potential moderators will be examined, as well as the methodological quality of the studies. Additionally, if there are enough studies with other experimental conditions comparable to the BPS, further comparisons will be carried out.

2. Method

2.1. Study selection criteria

Selection of studies was carried out independently by two reviewers (AC and GM). First, studies were screened by title and abstract. Then, selected studies went through a full-text revision.

The inclusion criteria were:

1. Empirical test of the effects of the BPS intervention. BPS intervention was defined as an exercise in which participants write about the best version of themselves in the future after everything has gone as well as it possibly could [4,7,8]. Studies that included this intervention as a component of a wider intervention which did not analyze the effects of the BPS separately would be excluded.

2. A minimum of two groups, one BPS condition and one control condition (placebo or waiting list).

3. At least one measure of wellbeing (i.e. satisfaction with life, positive affect), optimism, or depression, and two moments (before –pretest, and after the intervention –posttest).

4. Enough statistical data to conduct the calculations of the standardized effect sizes (means and standards deviations of the different groups both at pretest and posttest). If necessary, authors were contacted to provide missing information.

5. Study written in English or Spanish language.

2.2. Search strategy

A systematic literature search was carried out in November 2017 in PsychInfo, Web of Science, Cochrane, Scopus and PubMed databases with the terms “Best Possible Self” OR “Best Possible Selves”. In addition, this search was carried out in the databases of the main journals that commonly published works on PPIs: Journal of Positive Psychology, Journal of Happiness Studies, and Social Indicators Research. Furthermore, systematic reviews of PPIs [2,3,5,6], as well as the references from the retrieved studies, were also revised. To finish, experts on the field were consulted.

2.3. Outcome measures

In this meta-analysis, several outcome measures were included: wellbeing (which included measures of wellbeing, positive and negative affect, life satisfaction, or happiness), optimism (as the BPS intervention is a future-oriented positive activity that promotes a positive outlook in the future), and depressive symptoms.

For wellbeing, the most frequent scales used were the Positive and Negative Affect Schedule (PANAS) [9], the Satisfaction With Life Scale (SWLS) [10] , the Brief Multidimensional Students’ Life Satisfaction Scale (BMSLSS) [11], the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) [12], and Subjective Happiness Scale (SHS) [13]. Optimism was measured mainly with the Future Expectancies Scale (FEX) [14], the Life Orientation Test-Revised (LOT-R) [15], the Subjective Probability Task (SPT) [16], and the Attributional Style Questionnaire (ASQ) [17]. Finally, depression was measured by the Centre of Epidemiological Studies Depression Scale (CES-D) [18], the State-Trait-Anxiety-Depression Inventory (STADI) subscales of state euthymia (inverted), and state dysthymia [19], and the Beck Depression Inventory (BDI-II) [20].

2.4. Study selection criteria

Selection of studies was carried out independently by two reviewers (AC and GM). After duplicates were removed, the studies were screened by title and abstract. When at least one of the coders selected a study as potentially eligible, this study passed to the second phase. In this phase, the selected studies went through a full-text analysis by both reviewers. The inconsistencies between the coders were resolved by consensus.

Kappa coefficients (for the categorical variables) and intra-class correlations (for the continuous variables) were calculated to check the reliability of the coding process.

2.5. Coding of moderator variables

Extracted data were:

1. Delivery method of the intervention: individually or in groups, face-to-face or online, presence or absence of an explicit imagery component, and presence or absence of a compensation for participating as money or credit courses (as a reflection of the intrinsic motivation of participants).

2. Duration of the intervention: prescribed length (total number of days), intensity (minutes per week), and magnitude (total number of minutes).

3. Population: country of the study, target population (community, undergraduate students, clinical population, etc.), age (mean and standard deviation), percentage of women in the sample, and group sample sizes.

2.6. Quality of the studies

The methodological quality of the included studies was assessed with a scale of 9 items [21], and each criterion was rated as 0 (when the criterion was not met

or it was not reported) or 1 (when the criterion was met). Criteria were: (1) randomized assignment of participants, (2) baseline comparability between experimental and control conditions (if groups were matched at pretest measures or whether there were no statistically significant differences between the groups at pretest on relevant variables), (3) baseline comparability between dropouts and completers (if there were no dropouts, this item was coded as 1), (4) type of control group (active or waiting list), (5) concealment of assessors to the assigned condition of participants, (6) standardized scales used to assess the outcome measures, (7) attrition rate $\leq$ 10% , (8) intention-to-treat analyses (if there were no dropouts, this item was coded as 1), and (9) reporting bias (if all measures described in the method section were reported at results section).

2.7. Computation of effect sizes

The effect size index was the standardized mean difference between the change scores of the BPS and the control groups [22,23]. For each study, this index was calculated subtracting the mean pretest-posttest difference of the control groups ($\bar{y}_{pre,C}$ and $\bar{y}_{pos,C}$) from the mean pretest-posttest difference of the treatment group ($\bar{y}_{pre,T}$ and $\bar{y}_{pos,T}$), and dividing this difference by the pooled standard deviation of both groups in the pretest (S_{pre}):

$$d = c(m)\left[\frac{\left(\bar{y}_{pre,T} - \bar{y}_{pos,T}\right) - \left(\bar{y}_{pre,C} - \bar{y}_{pos,C}\right)}{S_{pre}}\right]$$

In general, the *d* index was calculated to compare BPS and control groups. However, we found that 7 studies included a gratitude group in addition to a control group. In these cases, the *d* index was also applied to compare BPS and gratitude groups. Positive *d* values indicated a better result of BPS than the control and gratitude groups.

In each study, a *d* index was calculated for each of the five different types of outcomes (wellbeing, optimism, depression, positive affect and negative affect).

The calculations of *d* indices for wellbeing encompassed measures of satisfaction with life, happiness, wellbeing, positive affect and negative affect (inverted). Additionally, due to the large number of studies that applied the PANAS scale [9], two additional meta-analyses were carried out for the positive and negative affect outcomes. Thus, a *d* index for positive affect and a *d* index for negative affect were calculated in the studies that included this scale. Optimism was comprised of measures of optimism and positive future expectancies. Regarding depression, only instruments that explicitly addressed depressive symptoms were included.

When a study applied several measures of the same construct (e.g., two different scales of optimism), a *d* index was calculated for each of them. Then, in order to avoid dependence problems, they were averaged to represent the specific study with only a *d* value for that type of outcome (optimism in the example). Separate meta-analyses were accomplished for each type of outcome, and the individual studies had not necessarily to include measures of all of them. For example, there were studies that only reported measures for wellbeing and optimism, but not for depression. In that case, these studies contributed only to the corresponding meta-analyses.

2.8. Statistical Analyses

Separate meta-analyses were carried out with the effect sizes for each of the five outcomes, and for the comparison of the BPS with control and gratitude groups.

In order to accommodate the variability exhibited by the effect sizes, a random-effects model was assumed [24,25]. This model involves weighting each effect size by its inverse variance defined as the sum of the within-study and the between-studies variances. The between-studies variance was estimated by restricted maximum likelihood. For each outcome measure, a weighted analysis of variance (ANOVA) was calculated in order to compare the mean effects of the 14 studies which used BPS as one single-session exercise and the 14 studies

which used BPS as a longer intervention. If no differences were found among them, the subsequent statistical analyses were carried out without considering such distinction. In addition, statistical analyses were carried out to compare the BPS with the gratitude interventions.

Several analyses were carried out in order to test whether publication bias could be a threat to the validity of the meta-analytic results. In particular, the Egger test was applied and funnel plots were constructed with the trim-and-fill method [26]. The Egger test consists of constructing an unweighted simple regression, with the effect size as the dependent variable and the standard error of each effect size as the independent one. A statistically non-significant result of the *t*-test for the hypothesis of an intercept equal to zero allows discarding publication bias.

Assuming a mixed-effects model, the influence of moderator variables on the effect sizes was calculated trough ANOVAs and meta-regressions for the categorical and the continuous variables, respectively [27,28]. The improved method proposed by Knapp and Hartung [29] was applied to test the statistical significance of each moderator variable. The *F* statistic allows testing the statistical association of a moderator variable with the effect sizes, and the Q_E and Q_W statistics enable us to examine the model misspecification for the continuous and categorical moderators, respectively. In addition, an estimate of the proportion of variance accounted for by the moderator variable was calculated by means of $R^2 = 1 - \hat{\tau}^2_{Res}/\hat{\tau}^2_{Total}$, with $\hat{\tau}^2_{Res}$ and $\hat{\tau}^2_{Total}$ being the residual and total heterogeneity variance estimates, respectively [30]. The moderator analyses were applied only for the outcome measure with a larger number of studies (i.e., wellbeing).

The statistical analyses were carried out with the *metafor* package in *R* [31].

3. Results

3.1. Coding reliability

Results on the reliability showed kappa coefficients ranging between .684 and 1.0 (M= .920) for categorical variables, and intra-class correlations between .958 and 1.0 (M = .994) for the continuous variables.

3.2. Descriptive characteristics of the studies

Selection process is illustrated in Figure1. First, 143 titles were retrieved from the databases, and 8 additional titles were retrieved through reference list searching and consulted experts. After duplicates were removed, 64 records were screened, and 20 of them were excluded after reading the abstracts. Finally, 44 articles were selected as potentially eligible studies, from which 19 did not meet the inclusion criteria.

Characteristics of the studies can be found in Table 1. One article included two studies [32], and two articles included BPS and control groups delivered through different methods, either writing or talking [33], or online or face-to-face [34]. These comparisons were treated as independent studies. One of the included studies was an unpublished dissertation [35], and one of them was a conference proceeding [36].

The 25 selected articles (with 28 studies) included 2,863 participants (1,247 in BPS groups, 1,155 in control groups and 461 in gratitude groups). The vast majority of them applied the interventions in University students (k = 22), some of them combined University students with the general population (k = 4), and only two studies were applied completely in the general population (community). Mean of participants' age was 23.58 (range from 17.83 to 35.62) with a standard deviation of 4.27 (range from 1.12 to 13.99), and the mean of the percentage of women of the samples was 74.40 (range from 52.70 to 100). Regarding the implementation of the intervention, fifteen studies included explicit instructions

for the visualization (imagery component), twenty-one dispensed money or credits to participants as a compensation for participation, three studies applied the intervention in small groups (vs. individually), and six used an online format (vs. face-to-face). One study used a waiting list as a control group, whereas the remaining studies included an active (placebo) control group. This group consisted in writing down about a neutral topic, usually about what participants did during the last 24 hours or in a typical day. Seven studies included a gratitude group in addition to the control and BPS groups. In the majority of the studies, gratitude interventions included writing down things participants were grateful for (k = 5), and two of them asked participants to write down a gratitude letter (k = 2). The duration of the interventions lasted from one single session to 56 days, with an intensity from 10 to 75 minutes per week, and a magnitude that ranged from 20 to 170 minutes of prescribed practice in total.

Concerning the assessed quality of the studies (see Table 2), scores of the included studies ranged from 4 to 8 in a scale from 0 to 9 (M = 6.52; SD = 1.37). None of the studies met all quality criteria, and only one study reported concealment of the assessors. All studies randomized participants to each condition and used standardized scales. The majority of the studies reported at results sections the measures reported at the method section. 17 studies reported baseline comparability between dropouts and completers, and 21 studies reported baseline comparability between BPS and control groups. Only one study used a no-active control group. Only half of the studies (14/28) did use intention-to-treat analyses, and attrition rates were higher than 10% in 20 studies.

Figure 1. Flow diagram

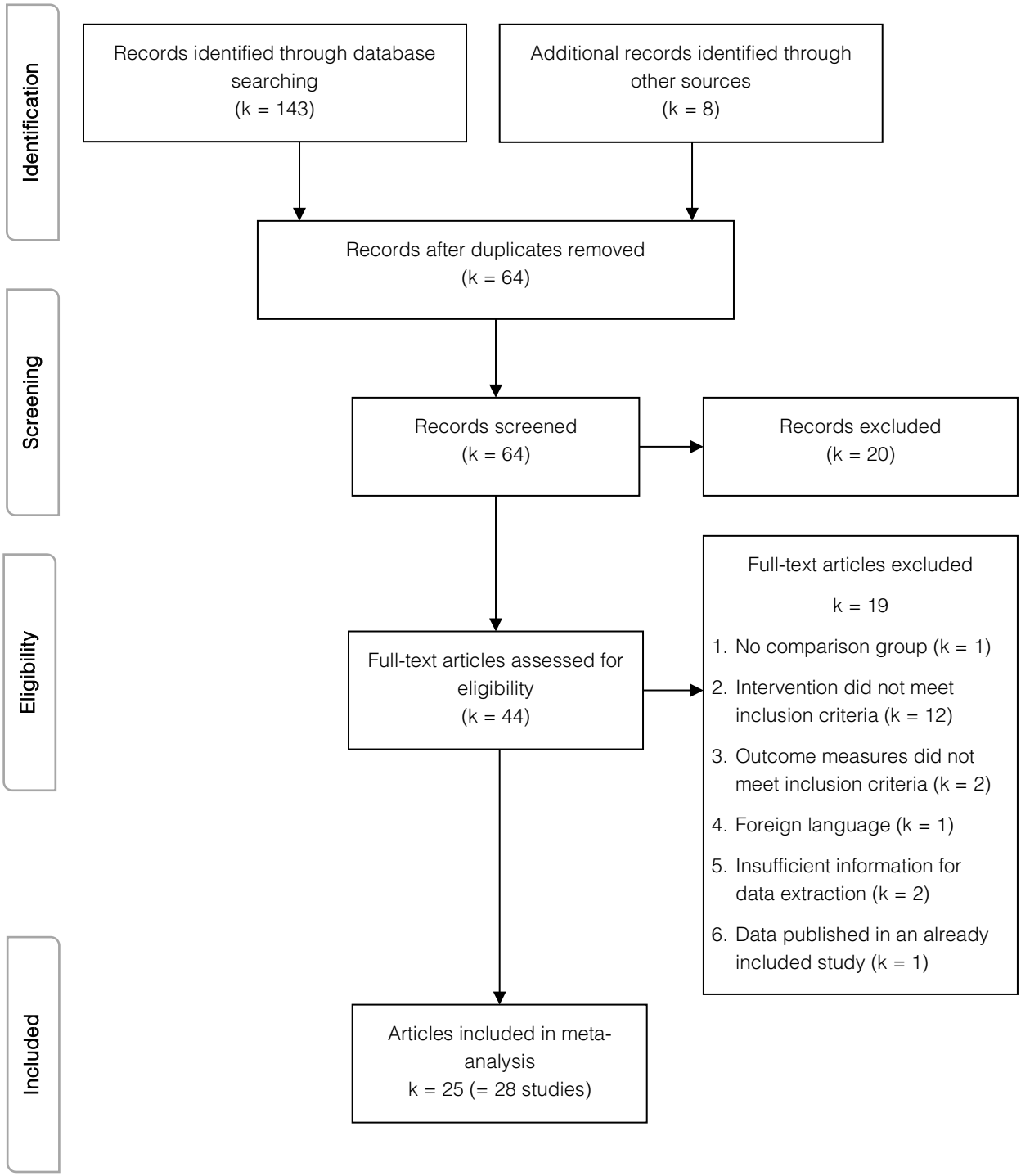


Table 1. Characteristics of the included BPS studies

Study	Application	Prescribed length (days), intensity (min. per week), magnitude (total min.)	N analyzed	Population, country, age (M, SD) % women	Outcome measures
Boehm et al. (2011) [37]	Individual, online Compensation	d=42, m/w=10, tm=60	BPS = 72 Control = 70 Gratitude = 71	Community, USA, 35.62 (11.36), 52.7%	LS: SWLS
Boselie et al. (2014) [38]	Individual, face-to-face Compensation, Visualize	d=1, m/w=20, tm=20	BPS = 38 Control = 36	Undergraduate, Netherlands, 21.90 (2.29), 78.4%	PA, NA: PANAS Opt: FEX
Boselie et al. (2016)a [32]	Individual, face-to-face Compensation, Visualize	d=1, m/w=20, tm=20	BPS = 41 Control = 40	Undergraduate, Netherlands, 21.35 (4.28), 79%	PA, NA: PANAS Opt: FEX
Boselie et al. (2016)b [32]	Individual, face-to-face Compensation, Visualize	d=1, m/w=20, tm=20	BPS = 32 Control = 29	Undergraduate, Netherlands, 21.84 (2.22), 73.8%	PA, NA: PANAS Opt: FEX
Boselie et al. (2017) [39]	Individual, face-to-face Compensation, Visualize	d=1, m/w=20, tm=20	BPS = 31 Control = 30	Undergraduate, Netherlands, 21.48 (2.47), 90.2%	PA, NA: PANAS Opt: FEX
Enrique et al. (2017) [40]	Individual, face-to-face Visualize	d=30, m/w=35, tm=170	BPS = 38 Control = 40	Various, Spain, 23.80 (3.85), 65.4%	PA, NA: PANAS Opt: LOT, SPT Dep: BDI-II

Table 1. Characteristics of the included BPS studies (continued I)

Study	Application	Prescribed length (days), intensity (min. per week), magnitude (total min.)	N analyzed	Population, country, age (M, SD) % women	Outcome measures
Geschwind et al. (2015) [41]	Individual, face-to-face Compensation, Visualize	d=1, m/w=20, tm=20	BPS = 25 Control = 25	Various, Belgium, 20.32 (1.97), 100%	PA: mDES
Hanssen et al. (2013) [14]	Individual, face-to-face Compensation, Visualize	d=1, m/w=20, tm=20	BPS = 40 Control = 39	Undergraduate, Netherlands, 22.59 (2.86), 81%	PA, VAS* Opt: FEX
Harrist et al. (2007)a [33]	Individual, face-to-face Compensation	d=1, m/w=20, tm=20	BPS = 19 Control = 20	Undergraduate, USA, 21 (?), 61.5%	PA, NA: Diener & Emmons, 1984
Harrist et al. (2007)b [33]	Individual, face-to-face Compensation	d=1, m/w=20, tm=20	BPS = 18 Control = 18	Undergraduate, USA, 21 (?), 72.2%	PA, NA: Diener & Emmons, 1984
King (2001) [4]	Individual, face-to-face Compensation	d=1, m/w=20, tm=20	BPS = 19 Control = 16	Undergraduate, USA, 21.04 (3.15), 83.1%	PA: Diener & Emmons, 1984
Layous et al. (2013)a [34]	Group, face-to-face Compensation	d=28, m/w=15, tm=60	BPS = 50 Control = 23	Undergraduate, USA, 19.10 (1.77), 71.8%	PA: Diener & Emmons, 1984

Table 1. Characteristics of the included BPS studies (continued III)

Study	Application	Prescribed length (days), intensity (min. per week), magnitude (total min.)	N analyzed	Population, country, age (M, SD) % women	Outcome measures
Meevissen et al. (2012) [36]	Individual, face-to-face Compensation, Visualize	d=1, m/w=20, tm=20	BPS = 37 Control = 35	Undergraduate, Netherlands, 21.30 (2.10), 100%	PA, NA: BMIS Opt: FEX
Ng (2016) [46]	Individual, face-to-face Compensation	d=21, m/w=?, tm=?	BPS = 118 Control = 98	Undergraduate, Singapore, 28 (?), 63.4%	H: SHS
Odou & Vella-Brodrick (2013) [47]	Individual, online Visualize	d=7, m/w=?, tm=?	BPS = 73 Control = 67 Gratitude = 70	Community, Australia, 34 (13.99), 74.8%	PA, NA: PANAS WB: WEMWBS
Peters et al. (2010) [48]	Group, face-to-face Visualize	d=1, m/w=20, tm=20	BPS = 44 Control = 38	Undergraduate, Sweden, 29.60 (?), 62.2%	PA, NA: PANAS Opt: SPT
Peters et al. (2013) [49]	Individual, face-to-face Compensation, Visualize	d=7, m/w=55, tm=55	BPS = 28 Control = 28 Gratitude = 26	Undergraduate, Netherlands, 22.80 (?), 84.1%	LS: SWLS Opt: LOT-R, ASQ
Peters et al. (2016) [50]	Individual, face-to-face Compensation, Visualize	d=1, m/w=20, tm=20	BPS = 28 Control = 28	Undergraduate, Germany, 23.50 (3.30), 57.14%	PA, NA: PANAS Opt: LOT, SPT

Table 1. Characteristics of the included BPS studies (continued IV)

Study	Application	Prescribed length (days), intensity (min. per week), magnitude (total min.)	N analyzed	Population, country, age (M, SD) % women	Outcome measures
Renner et al. (2014) [51]	Individual, face-to-face Compensation, Visualize	d=1, m/w=20, tm=20	BPS = 20 Control = 20	Undergraduate, Netherlands, 22.10 (?), 80%	PA, NA: PANAS
Sheldon et al. (2006) [52]	Group, face-to-face	d=28, m/w=?, tm=?	BPS = 23 Control = 23 Gratitude = 21	Undergraduate, USA, ? (?), 74.6%	PA, NA: PANAS
Summerfield (2015) [35]	Individual, online Compensation, Visualize	d=5, m/w=75, tm=75	BPS = 15 Control = 15 Gratitude = 15	Various, UK, ? (?), 73.3%	PA, NA: PANAS LS: SWLS
Yogo et al. (2008) [53]	Individual, face-to-face	d=1, m/w=20, tm=20	BPS = 27 Control = 28	Undergraduate, Japan, ? (?), 71.15%	NA: MMS

Abbreviations (in alphabetical order): ASQ = Attributional style questionnaire; BDI-II = Beck depression inventory – II; BMIS = Brief mood introspection scale; BMSLSS = Brief multidimensional students' life satisfaction scale; BPS = Best Possible Self; CES-D = Center for epidemiologic studies depression scale; d = days; Dep = Depressive symptoms; FEX = questionnaire for future expectations; H = Happiness; LOT / LOT-R = Life orientation test / revised; LS = Life Satisfaction; M = Mean; mDES = Modified differential emotions scale; MMS = Multiple mental states; m/w = minutes per week; NA = Negative Affect; Opt = Optimism; PA = Positive Affect; PANAS = Positive and negative affect schedule; POMS = Profile of mood states; SD = standard deviation; SHS = Subjective happiness scale; SPANE = Scale of positive and negative experience; SPT = Subjective probability test; STADI = State-trait anxiety-depression inventory; SWLS = Satisfaction with life scale; tm = total minutes; Various = Undergraduate students + community sample; VAS = Visual Analogue Scale; WB = Wellbeing; WEMWBS = Warwick-Edinburgh mental well-being scale.

Boselie (2016)b = study 1, Boselie(2016)b = study 2; Harrist et al. (2007)a = writing conditions, = Harrist et al. (2007)b = talking conditions; Layous et al. (2013)a = face-to-face conditions, Layous et al. (2013)b = online conditions.

Table 2. Quality assessment per study

Study	1	2	3	4	5	6	7	8	9	Total
Boehm et al. (2011) [37]	1	1	1	1	0	1	0	0	1	6
Boselie et al. (2014) [38]	1	1	1	1	0	1	1	1	1	8
Boselie et al. (2016)a [32]	1	1	1	1	0	1	1	1	1	8
Boselie et al. (2016)b [32]	1	1	1	1	0	1	1	1	1	8
Boselie et al. (2017) [39]	1	1	1	1	0	1	1	1	1	8
Enrique et al. (2017) [40]	1	1	0	1	0	1	0	1	1	6
Geschwind et al. (2015) [41]	1	1	1	1	0	1	1	1	1	8
Hanssen et al. (2013) [14]	1	1	1	1	0	1	1	1	1	8
Harrist et al. (2007)a [33]	1	0	1	1	0	1	1	1	1	7
Harrist et al. (2007)b [33]	1	0	1	1	0	1	1	1	1	7
King (2001) [4]	1	0	0	1	0	1	1	0	1	5
Layous et al. (2013)a [34]	1	1	1	1	0	1	1	0	1	7
Layous et al., (2013)b [34]	1	1	1	1	0	1	0	0	1	6
Liau et al. (2016) [42]	1	1	0	1	0	1	0	0	1	5
Lyubomirsky et al. (2011) [43]	1	1	0	1	0	1	1	0	1	6
Maddalena et al. (2014) [44]	1	1	0	1	1	1	1	0	1	7
Manthey et al. (2016) [45]	1	1	0	1	0	1	0	0	1	5
Meevissen et al. (2011) [8]	1	1	0	1	0	1	1	0	1	6
Meevissen et al. (2012) [36]	1	1	1	1	0	1	1	1	1	8
Ng (2016) [46]	1	1	1	1	0	1	1	0	1	7
Odou & Vella-Brodrick (2013) [47]	1	1	1	0	0	1	0	1	1	6
Peters et al. (2010) [48]	1	1	1	1	0	1	1	1	1	8
Peters et al. (2013) [49]	1	1	0	1	0	1	1	0	1	6
Peters et al. (2016) [50]	1	0	1	1	0	1	1	1	1	7
Renner et al. (2014) [51]	1	1	1	1	0	1	1	1	1	8
Sheldon et al. (2006) [52]	1	0	0	1	0	1	1	0	0	4
Summerfield (2015) [35]	1	0	0	1	0	1	0	0	1	4
Yogo et al. (2008) [53]	1	0	0	1	0	1	0	0	1	4
Total	28	21	17	27	1	28	20	14	27	183

Notes:
1 = Randomization
2 = Baseline comparability (BPS vs. control group)
3 = Baseline comparability (completers vs. dropouts)
4 = Active control group
5 = Concealment of assessors
6 = Standardized scales
7 = Attrition rate 20
8 = Intention-to-treat analyses
9 = Report bias

3.3. Mean effect size and heterogeneity

In order to compare the differential efficacy of BPS as one single-session exercise and as a longer intervention with the control group, weighted ANOVAs were applied for wellbeing, positive affect, negative affect, and optimism. Table 3 presents the results.

For wellbeing, although the mean effect size computed in the 14 studies that applied the BPS in one single-session was larger (d_+ = 0.381) than the obtained in the 14 studies that used a longer intervention (d_+ = 0.291), the difference was not statistically significant (p = .562) and null proportion of variance was explained (R^2 = 0). Figure2 presents a forest plot of these effect sizes grouped by the intervention duration (single-session and longer interventions).

As regards to positive affect, negative affect and optimism outcomes, the pattern of results was the same. In all cases, the difference between the two mean effects was not statistically significant, being the mean effect size in the single-session category larger than the ones in the longer intervention category for positive affect and optimism. S1 Figs 1-3 present the forest plots of these effect sizes for positive affect, negative affect and optimism outcomes grouped by the intervention duration (intervention and single-session). With regards to depression, the three studies applied the BPS as a longer intervention with a mean effect size of 0.115, 95% CI [-0.272, 0.502], exhibiting the effect sizes a moderate heterogeneity, I^2 = 42.66% [54].

Table 4 presents the results of comparing the efficacy of BPS and gratitude interventions for wellbeing, positive affect, and negative affect. The largest mean effect sizes were found for positive affect (d_+ = 0.326) and negative affect (d_+ = 0.485), effect estimates that reflect low-medium and medium magnitude, respectively [22]. A considerable small effect size was found for wellbeing (d_+ = 0.092). However, due to the small number of studies, mean effect sizes were not statistically significant for wellbeing and negative affect, attending to the confidence intervals, which included the zero value. Effect sizes presented a

large heterogeneity, with the *Q* statistics reaching statistical significance and the I^2 indices over 60% in all cases.

Table 3. Results of the weighted ANOVAs to compare the efficacy of BPS for single-session and longer intervention in each outcome measure.

Outcome measure	*k*	d_+	95% CI LL	95% CI LU	Q_{Wj}	ANOVA results
Wellbeing						$F(1,26) = 0.34$, $p = .562$
Intervention	14	.291	.027	.554	94.49****	$R^2 = 0.0$
Single-session	14	.381	.252	.511	15.10	$Q_W(26) = 109.59$, $p < .001$
Positive affect						$F(1,11) = 1.99$, $p = .186$
Intervention	6	.339	-.076	.753	19.13***	$R^2 = .13$
Single-session	7	.657	.277	1.037	25.20***	$Q_W(11) = 44.32$, $p < .001$
Negative affect						$F(1,11) = 0.69$, $p = .423$
Intervention	6	.411	-.932	1.755	168.71****	$R^2 = 0.0$
Single-session	7	-.021	-.188	.146	5.25	$Q_W(11) = 173.96$, $p < .001$
Optimism						$F(1,11) = 1.99$, $p = .186$
Intervention	5	.278	.004	.552	5.31	$R^2 = 0.0$
Single-session	8	.378	.320	.436	0.96	$Q_W(11) = 6.27$, $p = .855$

k = number of studies. d_+ = mean effect size. LL and LU = lower and upper 95% confidence limits for d_+. Q_{Wj} = within-group homogeneity statistic. *F* = Knapp-Hartung's statistic for testing the significance of the moderator variable. Q_W = statistic for testing the model misspecification. R^2 = proportion of variance accounted for by the moderator. ***$p < .001$. ****$p < .000$

Figure 2. Forest plot displaying the effect sizes (and 95% confidence intervals) for wellbeing as a function of the intervention duration of BPS intervention

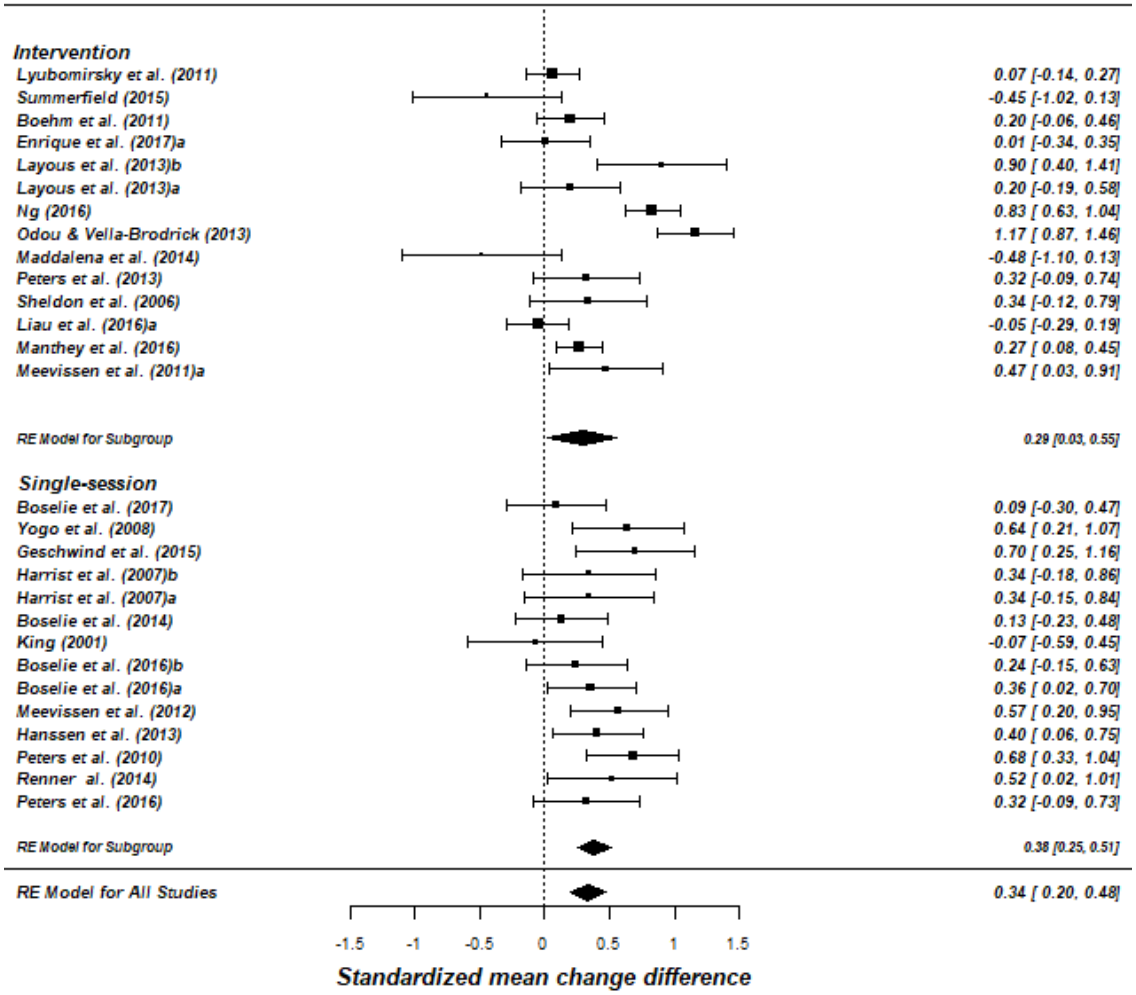


Table 4. Mean effect size, 95% confidence intervals, and heterogeneity statistics for the efficacy of the BPS versus Gratitude interventions.

Outcome measure	*k*	d_+	95% CI LL	95% CI UL	*Q*	I^2
Wellbeing	7	.092	-0.115	0.299	15.609*	63.23
Positive affect	5	.326	0.011	0.641	17.075**	70.36
Negative affect	5	.485	-0.301	1.271	65.931****	93.72

k = number of studies. d_+ = mean effect size. LL and LU = lower and upper 95% confidence limits for d_+. *Q* = Cochran's heterogeneity Q statistic; Q statistic has k – 1 degrees of freedom. I^2 = heterogeneity index. *p < .05. **p < .01. ****p < .0001.

3.4. Analysis of publication bias

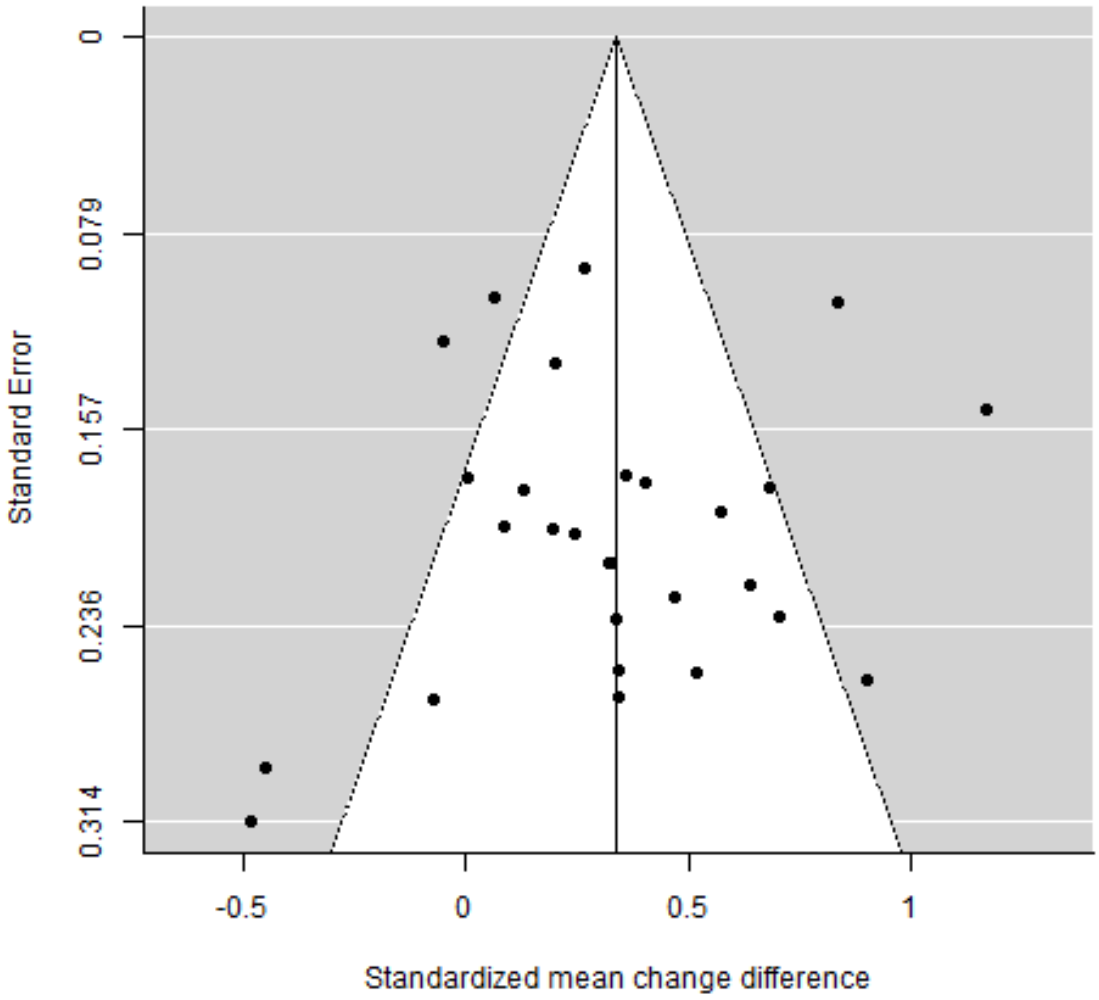
For wellbeing, positive affect, negative affect, and optimism outcomes the publication bias was assessed through Egger tests and funnel plots applying the trim-and-fill method. In the case of depression, this was not possible due to the small number of studies.

Regarding wellbeing, a non-significant result for the interception was obtained with the Egger test: $t(26) = -0.930$; $p = .361$. Figure3 presents the funnel plot obtained with the original 28 standardized mean change difference indices. Applying the trim-and-fill method, no standardized mean change differences had to be imputed to achieve the symmetry in the funnel plot.

The effect sizes obtained for positive affect, negative affect, and optimism outcomes also exhibited a statistically non-significant result for the intercept ($p = .206$, $p = 0.569$, $p = .526$, respectively). S1 presents the funnel plots for the standardized mean change difference indices for each of these outcomes. In particular, for positive and negative affect, the funnel plots were symmetric, and no additional indices had to be imputed (see S1 Figs 4 and 5). With respect to optimism, by applying trim-and-fill method, four additional standardized mean change difference estimates were imputed to the set of the original estimates to

achieve symmetry in the funnel plot (see S1 Figure6). When a mean effect (and its 95% CI) was calculated with the 13 *d* indices plus the four imputed values, the average effect was $d_+ = 0.28$ (95% CI: 0.19 and 0.37). If we compare the new effect with which was obtained with the 13 original *d* indices ($d_+ = 0.33$; 95% CI: 0.26 and 0.42) only slight differences are found. Therefore, the results obtained with the Egger test, and the funnel plot with the trim-and-fill method, led us to discard publication bias as a threat against these meta-analytic results.

Figure 3. Funnel plot of the 28 standardized mean change difference indices for wellbeing



3.5. Analysis of moderator variables

The results presented in Table 1 to compare the efficacy of BPS for intervention and single-session in wellbeing evidenced the existence of a large amount of heterogeneity according to the QW test ($p < .001$). Consequently, the influence of several characteristics related to the participants, intervention, and methodology was examined for wellbeing. As previously stated, given that positive and negative affect were included in the overall wellbeing outcome, and the small number of studies that included these constructs, optimism or depression, analyses of moderator variables were not carried out for these outcomes. In addition, as reported earlier, due to the fact that no significant differences were found among BPS as one single-session exercise and BPS as a longer intervention, the following statistical analyses were carried out without considering such distinction. Table 5 shows the results of the simple meta-regressions applied to continuous moderator variables. All moderators analyzed revealed non-statistically significant relationships with the effect sizes ($p > .05$). However, it is worth noting that the magnitude of the intervention, measured in total minutes, and the mean and standard deviation of age (in years) presented marginally, statistically significant results, as well as percentages of variance explained over 15% (see Table 5). For example, the mean age and the standard deviation of age presented a marginal association with the effect sizes ($p = .065$ and $p = .095$, respectively) with 15% and 20% of variance accounted for, respectively. In particular, the positive slopes showed that interventions carried out with older participants and heterogeneous in their age were associated with the largest effect sizes.

Table 6 presents weighted ANOVAs for the analysis of categorical moderator variables. Out of the different moderators analyzed, only the continent where the study was conducted exhibited a statistically significant relationship with the effect sizes ($p = .031$), with a large percentage of variance accounted for of 36%. As it can be seen, the largest mean effect size was yielded by the only study carried out in Oceania ($d_+ = 1.166$), whereas the mean effect sizes for the

remaining continents were very similar. In fact, when these analyses were repeated excluding the Oceania study, this moderator did not reach a statistical association with the effect sizes (p = .435).

Table 5. Results of the simple meta-regressions of continuous moderator variables on the effect sizes for wellbeing.

Moderator variable	k	b_j	F	p	Q_E	R^2
Prescribed length	28	-0.005	1.834	.187	96.974****	.06
Intensity (minutes per week)	24	-0.007	1.987	.173	49.084***	0
Magnitude (total minutes)	24	-0.003	3.472	.076	42.311**	.27
Mean age (years)	25	0.025	3.753	.065	85.753****	.15
SD of age (years)	19	0.037	3.184	.092	53.248****	.20
Gender (% female)	28	0.004	0.524	.476	110.227****	0
Methodological quality scale	28	0.056	1.185	.286	102.552****	.01
BPS group sample size	28	0.001	0.379	.543	109.875****	0
Control group sample size	28	0.001	0.121	.731	110.194****	0

k = number of studies. b_j = regression coefficient of each predictor. F = Knapp-Hartung's statistic for testing the significance of the predictor (the degrees of freedom for this statistic are 1 for the numerator and k – 2 for the denominator). p = probability level for the F statistic. Q_E = statistic for testing the model misspecification. R^2 = proportion of variance accounted for by the predictor. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table 6. Results of the weighted ANOVAs of categorical moderator variables on the effect sizes for wellbeing.

Moderator variable	*k*	d_+	95% CI LL	95% CI LU	ANOVA results
Delivery method:					
Individually	24	.348	.196	.501	F (1,26) = 0.14, p = .710 R^2 = 0.0
In groups	4	.278	-.087	.639	Q_W(26) =106.89, p < .001
Delivery method:					
Online	6	.373	.082	.665	F(1,26) = 0.09, p = .773 R^2 = 0.0
Face-to-face	22	.326	.165	.487	Q_W(26) =110.01, p < .001
Imagery component:					
No	13	.282	.079	.485	F(1,26) = 0.59, p = .447 R^2 = 0.0
Yes	15	.387	.195	.578	Q_W(26) =106.20, p < .001
Compensation for participation:					
No	7	.425	.159	.691	F(1,26) = 0.63, p = .434 R^2 = 0.0
Yes	21	.304	.141	.468	Q_W(26) =110,07, p < .001
Target population:					
Community	2	.671	.207	1.135	F(2,25) = 1.59, p = .223 R^2 = .05 Q_W(25) = 99.45, p < .001
Undergraduate	22	.333	.179	.488	
Various	4	.165	-.192	.522	
Continent:					
Europe	15	.317	.150	.484	
N. America	9	.208	-.018	.433	F(3,24) = 3.49, p = .031 R^2 = .36 Q_W(24) = 69.07, p < .001
Oceania	1	1.166	.578	1.754	
Asia	3	.462	.123	.800	

k = number of studies. d_+ = mean effect size. LL and LU = lower and upper 95% confidence limits for d_+. F = Knapp-Hartung's statistic for testing the significance of the moderator variable. Q_W = statistic for testing the model misspecification. R^2 = proportion of variance accounted for by the moderator.

4. Discussion

This is the first meta-analysis that examined the efficacy of the Best Possible Self exercise compared to controls on wellbeing and other related outcomes. Following a systematic review of the literature, 25 articles (with 28 studies) were included in the analyses, leading to a total of 2,863 participants. Small to moderate effect sizes were found for wellbeing, optimism, positive and negative affect and depressive symptoms [22,55]. The index of the effect size used was the standardized mean difference between the change scores of the BPS and the control groups. This index, although scarcely used in practice, has the advantage of controlling for pretest differences between the groups, as well as for maturation, history, or testing effects from pretest to posttest [22,23].

Significant increases were found for wellbeing, in which the mean effect size after one single BPS session was $d_+ = 0.381$, corresponding to a low-medium effect size [22], and $d_+ = 0.291$ for longer BPS interventions, which corresponds to a small effect size. The effect sizes obtained in the current meta-analysis for wellbeing are lower than the effect sizes found in the meta-analyses of PPIs conducted by Sin and Lyubomirsky [2] ($d = 0.61$), but slightly greater than the ones found in the meta-analysis conducted by Bolier and colleagues [3] ($d = 0.34$ and $d = 0.20$). These meta-analyses showed that PPIs (without distinction of the specific type of PPI) produce small to moderate effects on wellbeing, and similar results were found in this meta-analysis of BPS interventions.

Moderator analyses for the quantitative variables did not show any significant relationship with wellbeing outcomes. However, in view of the large number of studies included in these analyses, the marginally effects observed for the magnitude of the intervention (that is, the total number of minutes that participants were required to practice the exercise), and the age of the participants are worth to mention. These results might indicate that processes such as the hedonic adaptation could affect the effectiveness of interventions, causing that the effects produced by shorter practices may fade when participants are asked to practice more time. In addition, the marginal effects of

age as a moderator of the intervention should be understood within a cohort of young adults from 18 to 35 years, indicating that interventions carried out with older participants in this age range lead to better outcomes. These results somehow contradict the theoretical assumptions of Lyubomirsky and Layous [56], who hypothesized that PPIs with a future-time orientation as the BPS intervention, would be more beneficial for young people. In any case, it is worth considering that the age range of the participants is notable low. In regard to the moderator analyses for the categorical variables, none of them showed a relationship with wellbeing outcomes. As a whole, the moderator analyses observed in this study support the statements derived from a recent qualitative review about the BPS intervention, which suggested that BPS is a flexible and efficacious intervention regardless the delivery method or the features of the person [5].

Although many studies have used the BPS exercise to specifically promote optimism, effect sizes of the BPS intervention on optimism are slightly lower than the effects observed on wellbeing. Results follow a similar pattern, where a significant moderate effect size is observed at short-term (d_+ = 0.378) and these effects decrease to a small effect size in the long term (d_+ = 0.278). Overall, the effect sizes obtained in our meta-analysis for optimism outcomes are lower than the ones observed in the meta-analysis of Malouff and colleagues [6]. In this case, the different studies included and the type of calculation of the effect size could account for this difference.

Regarding depression, only three studies which used BPS as a longer intervention (vs. single-session) could be entered for the effect size calculus, which was small (d_+ = 0.115). These results are slightly lower than the ones presented in the last meta-analysis of PPIs [3] (d = 0.23), although both are considered small. The revision by Loveday [5] concluded that BPS can be used with depressive patients, among others. Nevertheless, considering the small number of included studies which assessed depressive symptoms, quantitative results of BPS interventions on depression should be taken with caution.

Since a large number of studies included the PANAS scale [9], we were able to conduct a separate meta-analysis for the effects on positive and negative affect assessed with this specific questionnaire. This is one of the most widely used scales to measure positive and negative mood, and it has been widely validated showing good psychometric properties [57–59]. Effects of BPS on positive affect showed a high-medium effect size of d_+ = 0.657 for the single-session studies and a low-medium effect size of d_+ = 0.359 for the longer intervention studies. These effects were larger than the ones obtained in the other related outcomes. For negative affect, a negative small effect size was found for single-session (d_+ = -0.021), which implies that the BPS condition (vs. controls), is less effective to decrease the levels of negative affect. However, its size is considerably small. A moderate effect size was found for longer interventions (d_+ = 0.411), indicating an improvement. In the case of negative affect, longer BPS interventions seem to produce better outcomes than one single-session BPS exercise.

On account of some studies which included a gratitude intervention group in addition to BPS and controls, it was possible to conduct a meta-analysis on the efficacy of the BPS over gratitude interventions. A small effect size was found for positive affect (d_+ = 0.326), and a moderate effect size for negative affect (d_+ = 0.485). The effect size on wellbeing was considerably small (d_+ = 0.092). Notwithstanding the small number of studies included, it is possible to infer that BPS seems to produce better results than gratitude interventions on positive and negative affect. More research is needed in order to expand the knowledge about the comparability of these two PPIs.

Regarding single-session and longer BPS interventions, it is possible to observe a stable tendency which suggests than shorter interventions have higher effect sizes than the larger ones (excepting for negative affect), despite the fact that no significant differences were found between the effect sizes. It is worth to consider that single-session studies applied the intervention in a laboratory context, in which participants practiced the exercise under the supervision of a researcher. In the case of the longer intervention studies, participants' practice

could not be supervised, and it is possible that they did not follow the prescribed instructions. In addition, it is also possible that processes such as the hedonic adaptation could affect the effectiveness of interventions that are practiced for longer periods of time [60]. Including a register of the participants' practice during the intervention as well as qualitative data about their opinion and possible difficulties in their practice could shed light on these results.

No indication for publication bias was found for any of the different outcomes assessed, which goes in line with a recent meta-analysis on psychological wellbeing conducted by Weiss and colleagues [61]. Furthermore, we included grey literature, which, along with some studies with negative results, might have helped to the absence of trimmed studies by providing a more complete picture of the field.

This study has some limitations. First, none of included studies met all the quality criteria. For example, only one study included the concealment of the assessors, half of the studies did not use intention-to-treat analyses, and 11 of 28 studies did not analyze baseline comparability between completers and dropouts (considering that some of the remaining 17 studies did not have any dropout). Second, the type of population included in the studies was mainly based on University students and young participants, which limits the generalizability of the results. This is a common issue in Psychology research [62,63], and future studies need to consider broadening the population in which studies are applied. In the same line, none of the studies (not even the ones which measured depression) delivered the intervention to clinical patients. Hence, it is still necessary to study the efficacy of the BPS in this population. Third, regarding quantitative analyses, it is possible that the small number of studies contributed to the lack of significance in some results of this meta-analysis. Besides, we were not able to adjust a multiple meta-regression model including a subset of characteristics of studies that could explain the variability exhibited in the effect sizes on wellbeing. Finally, follow-up analyses were not included due to the small number of studies which reported them.

The results of this meta-analysis have several implications for research and clinical practice. Notably, BPS has shown to be an effective intervention to improve positive affect, wellbeing, and optimism, and to decrease negative affect and depressive symptoms with small to moderate effect sizes. In relation to moderator variables, analyses showed that the intervention can be equally effective independently of the delivery method: individual or in groups, online or face-to-face, with or without an explicit imagery component, etcetera. Marginally significant differences were found regarding mean age and age standard deviation, which implies that the age of participants could play a role in the efficacy of the intervention. It is important that future studies include more heterogeneous and older participants in order to address this issue. No differences were found in prescribed length and intensity, but a marginally significant difference emerged in the magnitude of the intervention. This result, in addition with the larger effect sizes found in the single-session studies versus the longer intervention studies, could lead us to infer that short interventions may lead to more benefits from the BPS. However, these results should be further explored, as no significant differences emerged. In this line, further studies which include qualitative data (for example, content analyses of the texts) could cast light on these results, and on possible variables that could play a role in the efficacy of the BPS and which cannot be addressed in a quantitative approach.

In conclusion, this study contributed to a better understanding of the effectiveness of one of the most applied PPIs. Results of this meta-analysis showed that BPS can be considered an effective intervention for wellbeing increase. Further research is needed in order to shed light on the factors that may influence its efficacy, given the lack of significance in the moderator analyses. Nevertheless, these results permit to recommend this intervention as a valuable resource for psychologists and other professionals to improve clients' wellbeing.

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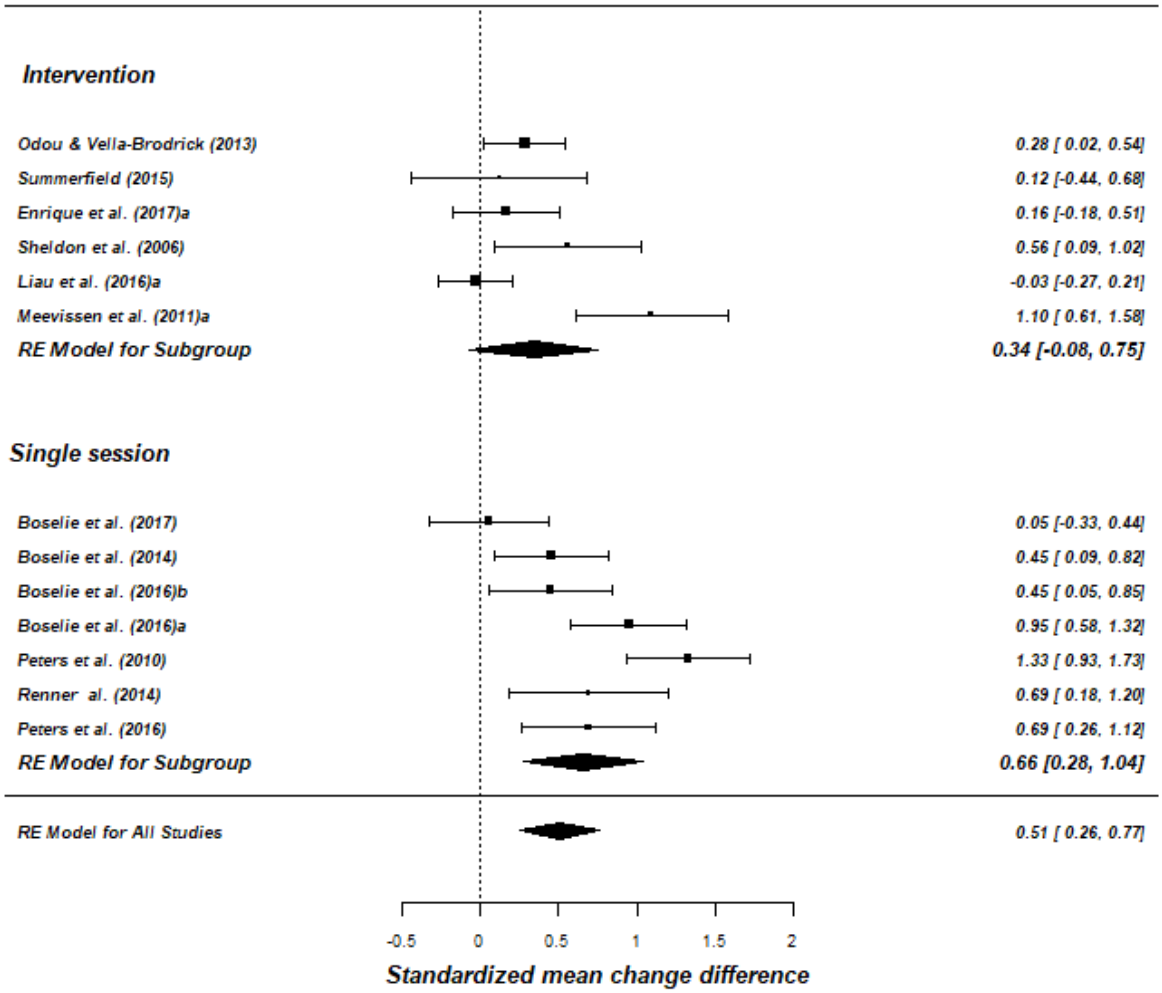
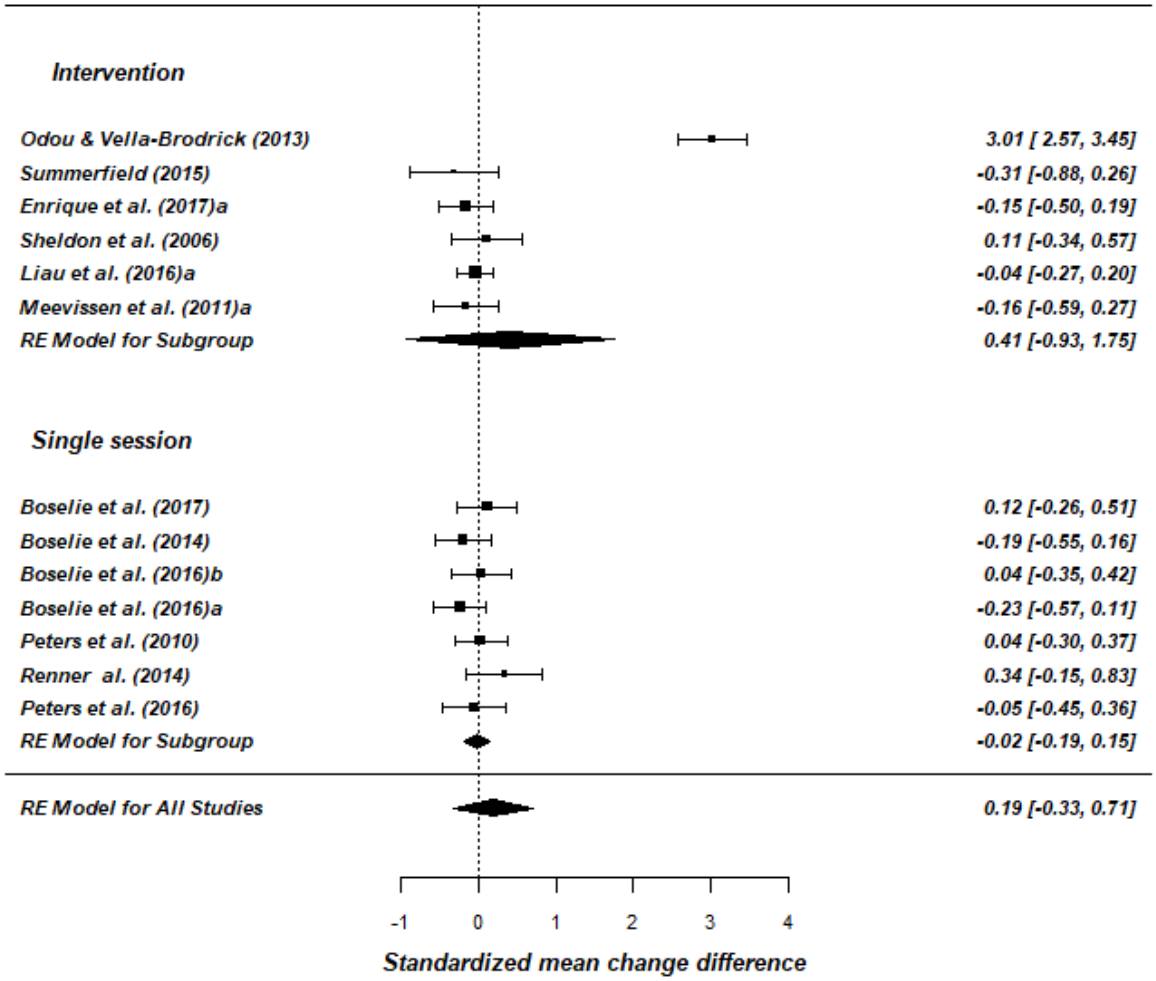
Supporting information (S1):

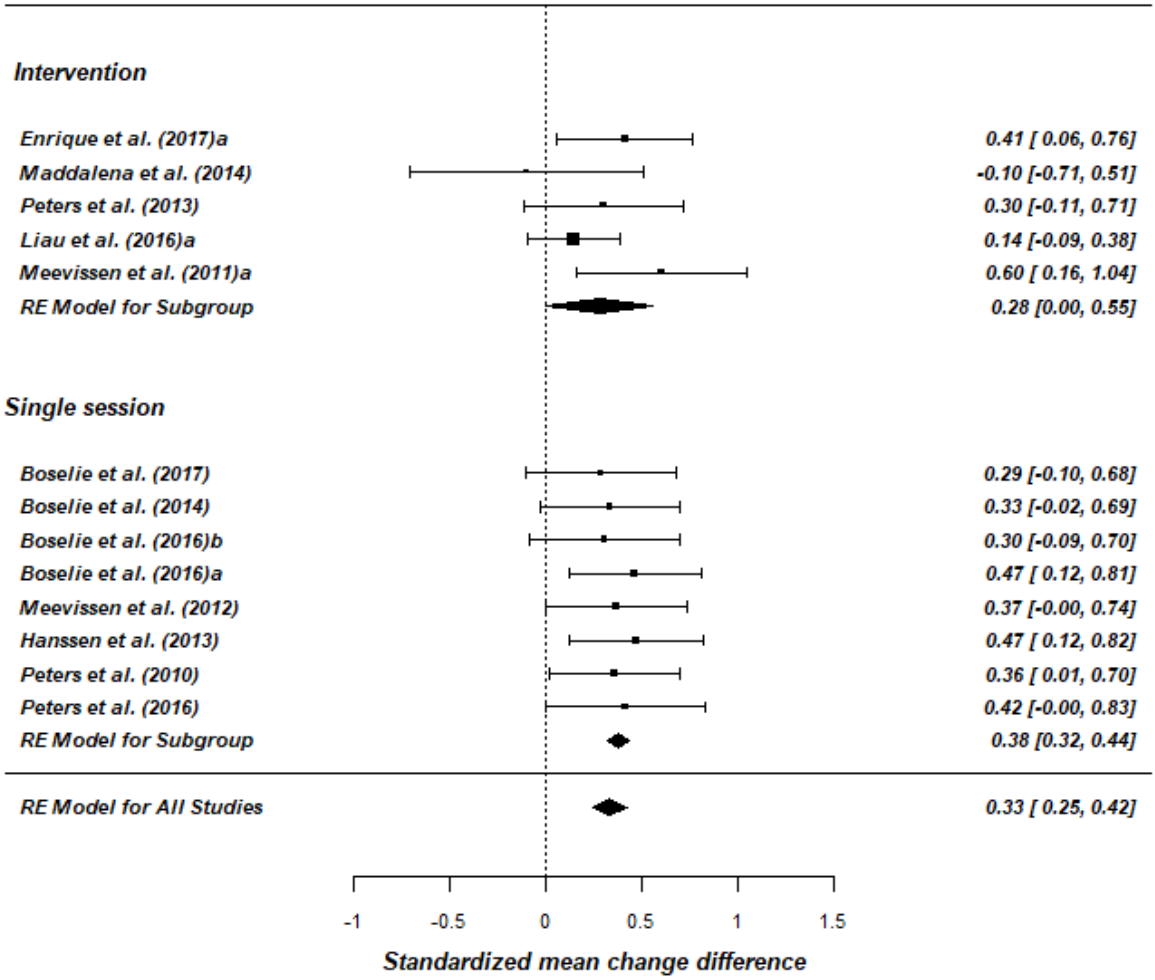
S1 Figure 1. Forest plot displaying the effect sizes (and 95% confidence intervals) for positive affect as a function of the intervention duration of BPS intervention.



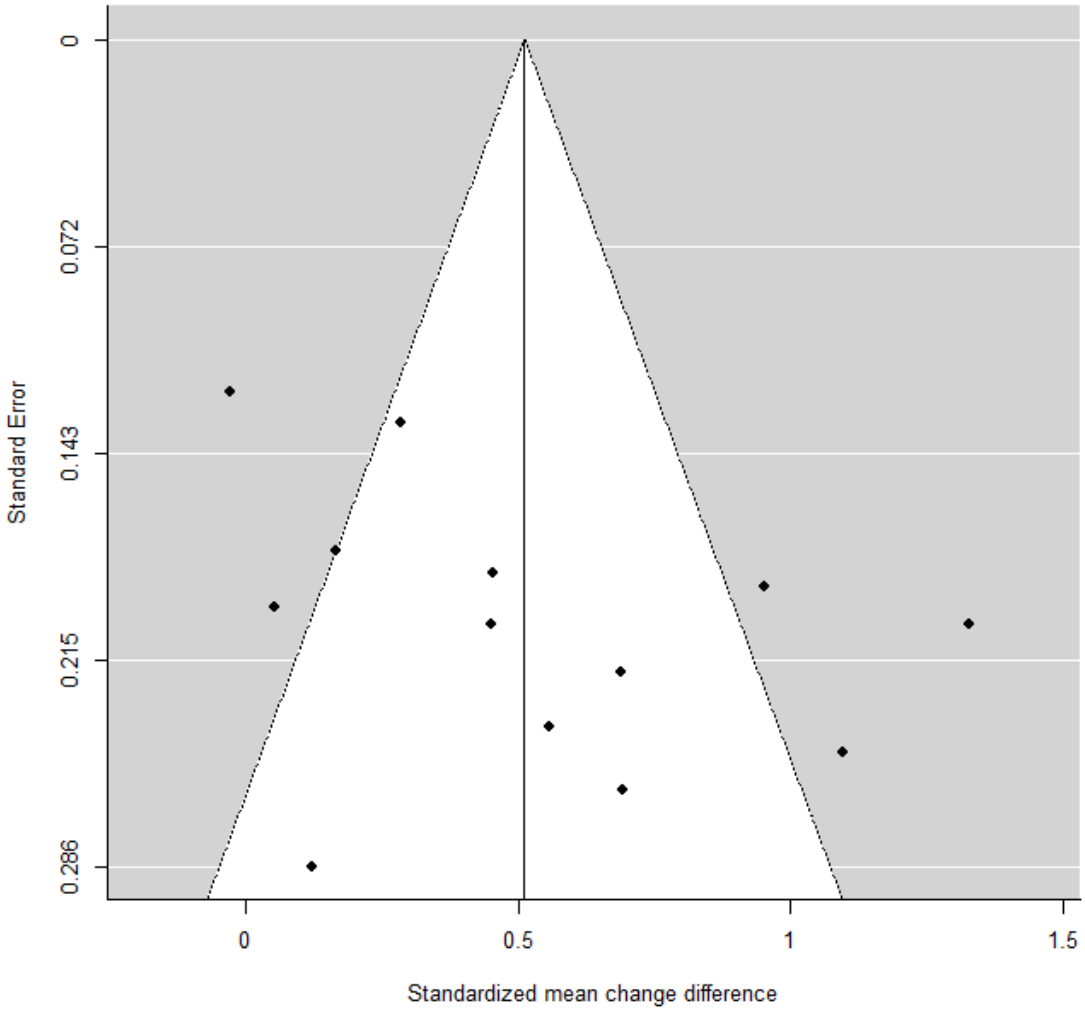
S1 Figure 2. Forest plot displaying the effect sizes (and 95% confidence intervals) for negative affect as a function of the intervention duration of BPS intervention.



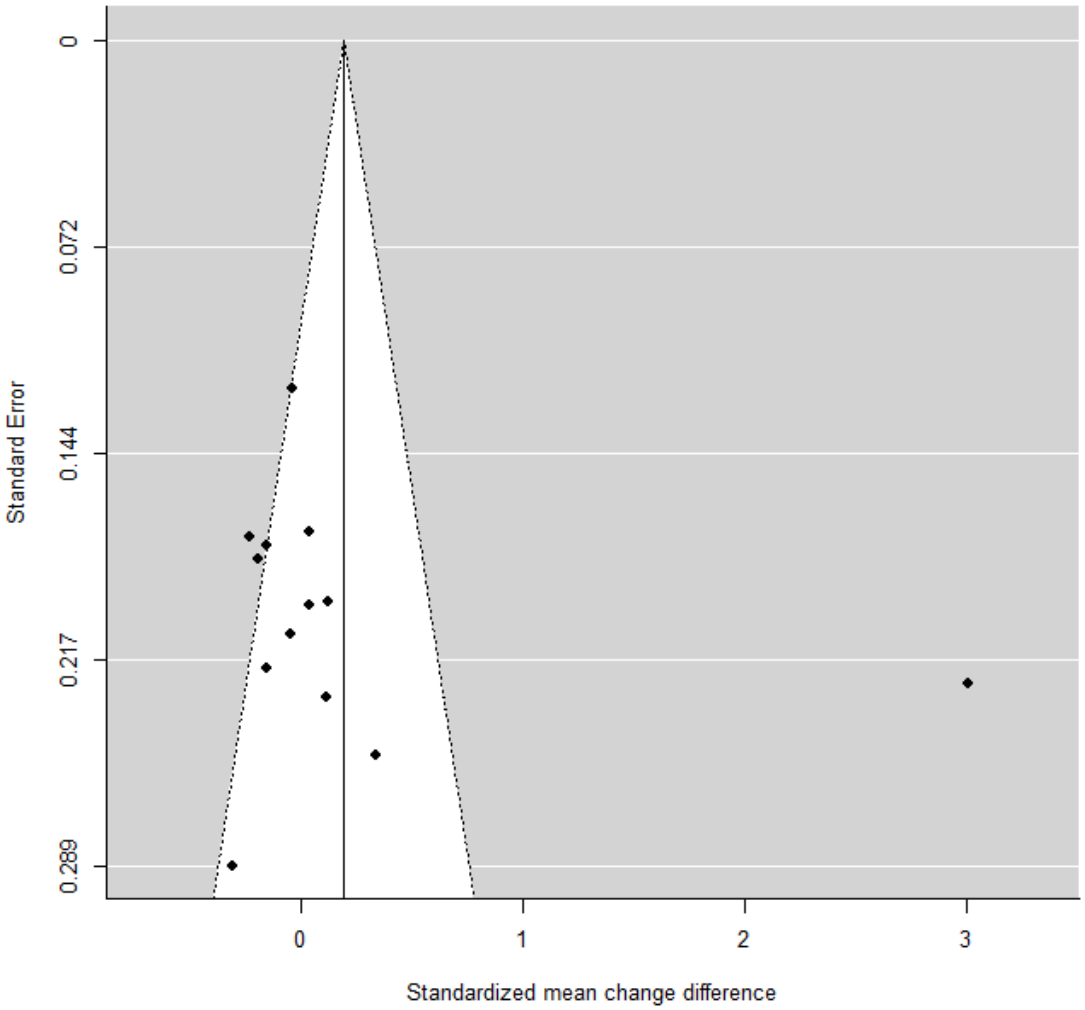
S1 Figure 3. Forest plot displaying the effect sizes (and 95% confidence intervals) for optimism as a function of the intervention duration of BPS intervention.



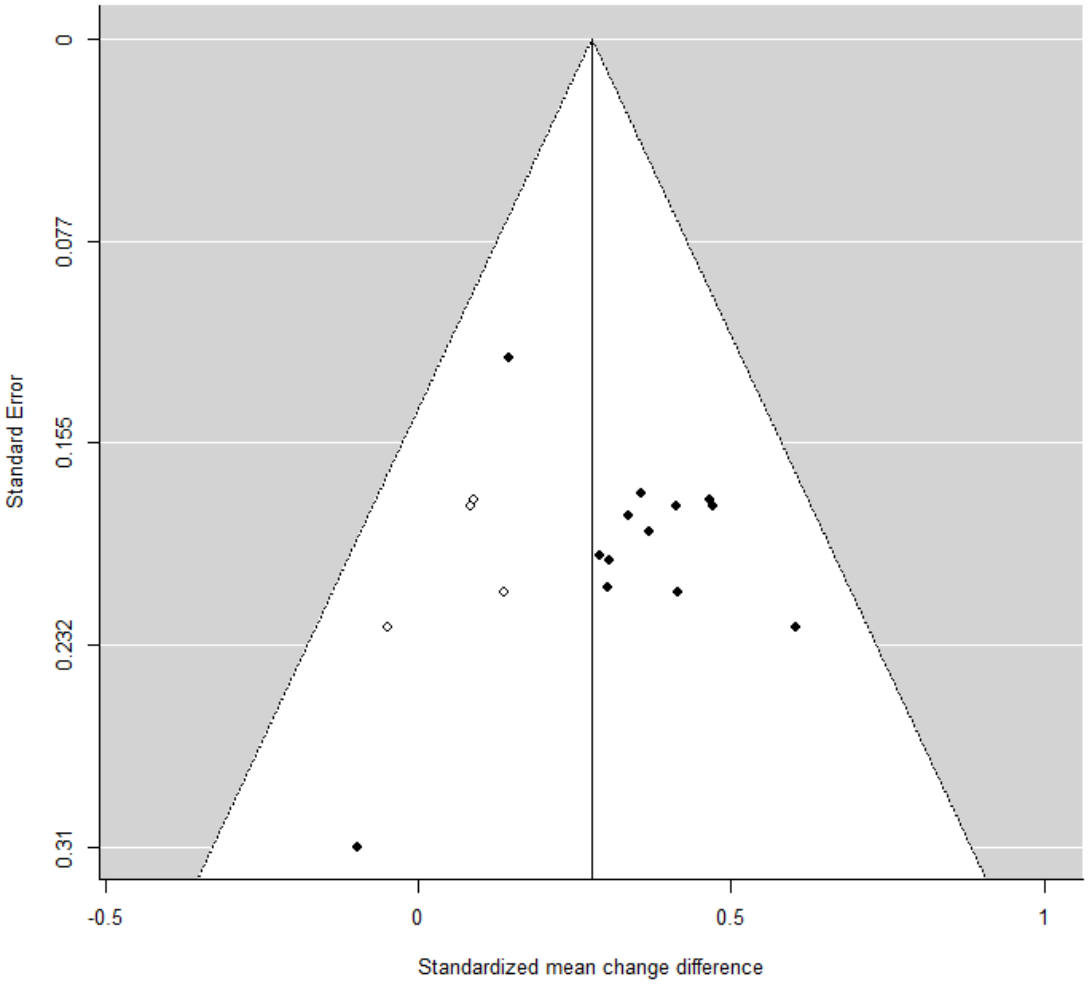
S1 Figure 4. Funnel plot of the 13 standardized mean change difference indices for positive affect.



S1 Figure 5. Funnel plot of the 13 standardized mean change difference indices for negative affect.



S1 Figure 6. Funnel plot of the 13 standardized mean change difference indices for optimism. The four white circles are imputed effect sizes by means of the Duval and Tweedie's trim-and-fill method.



3

Past, present, and future life satisfaction: the role of age, positive and negative mood

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Abstract

Life satisfaction (LS) is one of the key elements of subjective wellbeing (SWB). The Temporal Satisfaction with Life Scale (TSWLS; Pavot et al. 1998) measures LS including its temporal aspects, and provides scores for past, present, and future LS. The aim of this study was to replicate the three-factor structure found in previous studies in a Spanish-speaking general population, to analyze potential differences in temporal LS on different age groups and gender, and to explore the relationships between past, present, and future LS and the affective components of SWB (positive and negative mood). The sample consisted on 491 participants with an age range of 18 to 80 years old (M = 32.07, SD = 14.59). Confirmatory factor analysis, bivariate Pearson's correlations, and multiple regression analyses were conducted. Results confirmed the three-factor structure of the scale and its good psychometric properties. All participants showed higher levels of present LS than past LS, and older respondents presented higher levels of present LS than future LS. No gender differences were found, but younger respondents scored higher on future LS than older ones. Significant correlations were found between mood and temporal LS, and happiness emerged as a predictor of present LS, whereas positive affect was a predictor of past and future LS. Negative mood played a minor role as a predictor of temporal LS. These findings shed light on the patterns of past, present, and future LS in different age groups, and contribute to the knowledge about how mood and temporal LS are related.

1. Introduction

Subjective Wellbeing (SWB) has been defined as a multifaceted concept that refers to people's overall emotional experiences and their appraisals of their own life (Diener et al. 2006). Thus, it can be divided into the equilibrium between positive and negative experienced emotions and mood (e.g. frequent feelings of happiness or absence of depressive symptoms) and the cognitive evaluation of one's life, also known as "life satisfaction" (LS) (Diener 1994; Diener 2009; Lucas, Diener and Suh 1996; Luhmann, Hofmann, Eid and Lucas 2012). These two factors are interrelated, and even though LS is somewhat stable in time, it can be influenced by life events and affective states: when people make judgments about their LS, the balance between positive and negative emotions and the valence of their experiences influence on their responses (Kuppens, Realo and Diener 2008; Lucas et al. 1996). There are significant correlations between the affective and cognitive components of SWB. Certainly, general LS has consistently been found to be positively related to the frequency of pleasant emotions and negatively related to negative mood, depressive symptoms, and other clinical measures of distress (e.g. Diener and Lucas 2000; Kuppens, Realo and Diener 2008; Lucas, Diener and Suh 1996; Nes et al. 2013; Suh, Diener, Oishi and Triandis 1998). However, both constructs are independent and need to be measured separately (Lucas, Diener and Suh 1996; Pavot and Diener 2008).

Several approaches have been used to measure LS. One of them is the well-known *Satisfaction With Life Scale* (SWLS) (Diener, Emmons, Larsen and Griffin 1985), a brief 5-item assessment of one's general sense of satisfaction with life as a whole. It is a widely used measurement, and it has shown good psychometric properties in a plethora of studies (see Pavot and Diener 2008; Vassar 2008). It has been translated into many languages (e.g. Spanish, French, German or Czech) and assessed in different cultures (see Pavot and Diener 2008) and contexts (e.g. Arrindell, van Nieuwenhuizen and Luteijn 2001; Elliott, Shewchuk, Miller and Richards 2001). However, this scale does not include the

temporal aspect of LS in the global assessment of the construct. Therefore, when asked to make judgments about their life as a whole, respondents may wonder whether the question refers to all aspects of their current life, their life over time, or both (Pavot, Diener and Suh 1998). Depending on the focus that respondents may choose, their responses will likely be different. Furthermore, the original items of the scale seem to reflect different temporal foci (Pavot et al. 1998; Pavot and Diener 2008). For example, item #5 ("If I could live my life over, I would change almost nothing") seems to imply a past orientation, and it has shown lower correlations with the rest of the scale, whereas other items seem to refer to a present orientation or a temporal summary, yet they do not provide temporal cues. For example, the item #3 ("I am satisfied with my life"), in which respondents might answer by thinking about their recent days, months, or years, visualizing a future event that is coming soon, or even thinking about a traumatic past event in their childhood. Adding temporal specificity may not eliminate all the potential sources of error when assessing LS, but it can prompt the focus on a specific time frame, and thus permit a more accurate assessment of LS (Pavot et al. 1998).

The *Temporal Satisfaction with Life Scale* (TSWLS) was developed to overcome these limitations (Pavot et al. 1998). It comprises 15 questions derived from the 5 original items on the SWLS, and it measures LS on three temporal axes: past, present, and future. Hence, it makes it possible to examine more comprehensively the level of LS across the different portions of the lifespan. For example, the original item "I am satisfied with my life" was reworded as "I am satisfied with my life in the past" (past LS), "I am satisfied with my current life" (present LS), and "I will be satisfied with my life in the future" (future LS). Therefore, the questionnaire has three subscales, each corresponding to a temporal focus: past LS (items 1 to 5), present LS (items 6 to 10), and future LS (items 11 to 15). In the original work by Pavot and colleagues (Pavot et al. 1998), a three-factor structure was found, corresponding to the three subscales (past, present, and future LS) along three studies with University students, adults and older adults, respectively. The scale has been validated in several languages

with mixed results regarding its structure, which were applied to samples either young (McIntosh 2001; Ye 2007) or old (Tomás, Galiana, Oliver, Sancho and Pinazo 2016). The three-factor structure was confirmed in a Canadian construct validity study (McIntosh 2001) within a young sample of undergraduates, and partially confirmed in a non-western context, in which a Chinese validation (Ye 2007) also found this structure in University students but excluding the first and fifth items from each subscale (items 1, 5, 6, 10, 11, and 15). There is a German adaptation (Trautwein 2004) only available in German language that could not be reviewed for this study. On the other hand, a Spanish version of the scale applied in an elderly population (55 to 92 years old) found, unlike previous studies, a bifactorial model to be the structure with the best fit, with one general dimension of life satisfaction and three domain-specific factors of past, present, and future LS (Tomás et al. 2016). These divergences might be due to the fact that LS scores can be sensitive to age: life experiences and satisfactions can be different across different developmental stages (Pavot et al. 1998; Pavot and Diener 2008). In this sense, Proyer and colleagues (2011) analyzed the scores of the TSWLS among different age stages in a German-speaking women sample with a German version the scale that comprised 12 items (Trautwein 2004). It was found that females of 41 to 55 years old scored significantly lower on past LS than younger and older participants. However, this study included only German-speaking women, and no other studies have carried out specific analyses comparing past, present, and future LS in different age stages neither with other language variants of the scale. In addition, given that the aforementioned validation studies only included samples that were either young or old, it is still necessary to explore how temporal LS is related to age, and to confirm the structure of the scale with a broader sample. On the other hand, although LS tends to be stable among males and females, results on temporal LS are not clear: whereas the original study (Pavot et al. 1998) and the subsequent construct validity study (McIntosh 2001) found no significant differences depending on gender, the Chinese validation study found that females scored significantly higher on past LS than males (Ye 2007).

Consequently, there is a need to further explore whether there are differences between males and females in temporal LS.

As previously sated, mood and LS have been consistently found to be correlated, but the knowledge about the nature of this relationship is still scarce in the case of temporal LS. Only two studies explored the relationship between mood and LS including its temporality, which included diverse mood measures and found different results regarding the weight of the correlations. Authors of the original validation of the TSWLS (Pavot et al. 1998 Study 3) found significant positive correlations between happiness and temporal LS in a study with older participants (which were moderate to large in the case of past LS, small in the case of present LS, and moderate for future LS according to Cohen, 1988), and significant negative large correlations between depressive symptoms and temporal LS (past, present and future LS). Sailer and colleagues (2014) found significant positive correlations between temporal LS and positive affect (small in the case of past LS, large for present LS and moderate for future LS), and significant negative correlations between this construct and negative affect (moderate to large in all cases) in a sample of university students and attendants to a gym complex from Sweden. Although both studies found similar negative correlations among temporal LS and negative mood (negative affect or depressive symptoms), it is worth to note that some differences emerged in the magnitude of the correlations of the positive measures. In the first study (Pavot et al., 1998), happiness showed a stronger correlation with past LS comparing with present and future LS, and the second mentioned study (Sailer et al., 2014) found an opposite result for positive affect: present and future LS showed stronger correlations than past LS. It is worth to note that these studies did not include the same measures (e.g. happiness vs. positive affect), therefore there are not directly comparable. As far as we know, no other studies have explored the relationship between mood and LS including the different time frames, and none of them have been carried out in a Spanish-speaking sample with wide age ranges.

Therefore, this study had three objectives: first, to replicate the three-factor structure of the TSWLS found in previous studies in a Spanish-speaking general population; second, to explore the role of sociodemographic factors (age and gender) in past, present, and future LS; and third, to explore the relationship between mood and LS, including its temporality. For this third objective, measures included in previous studies were used (Pavot et al., 1988; Sailer et al, 2014): positive and negative affect, happiness, and depressive symptoms.

2. Method

2.1. Participants

The sample consisted of 491 participants (74.5% women) with ages between 18 and 80 years old (*M* = 32.07, *SD* = 14.59). All participants were Spanish-speakers; 89% were Spanish, 3.3% from other European countries, 7.1% from Latin American countries, and 0.6% did not report their nationality. Regarding occupation, 51.4% were studying, 36.4% were working, and 12.1% were unemployed or retired. With regard to marital status, 44.8% were single, 49.3% had a stable relationship or were married, 4.9% were divorced, and 1% were widowed.

2.2. Instruments

The Temporal Satisfaction with Life Scale (TSWLS; Pavot et al. 1998). This scale measures past, present, and future LS. It contains 15 items divided into three subscales: past LS (items 1-5), present LS (items 6-11), and future LS (items 12-15). It is also possible to calculate a global LS score by adding the scores of all items together. Respondents rate their agreement with each statement on a 7-point Likert style scale (1 *strongly disagree* – 7 *strongly agree*). All items are positively worded; hence, the higher the score, the higher level of LS. Cronbach's alphas for the complete scale ranged from .91 to .93 in the original

studies (Pavot et al. 1998). In the elderly Spanish validation study, the total scale's alpha was .91 and it ranged from .81 to .86 among the subscales (Tomás et al. 2016). For the purposes of this study, the original scale (Pavot et al. 1988) was translated from the original English to Spanish language by a bilingual expert in the field (AC). Then, two experts in the area revised this translation (RM and EE) (see Appendix A). In this version, Cronbach's alpha was .89 for the total scale, .84 for the past LS subscale, .91 for the present LS subscale, and .87 for the future LS subscale.

Positive and Negative Affect Scale (PANAS; Watson, Clark and Tellegen 1988). It is a 20-item scale with 10 positive emotions and 10 negative emotions, divided into two subscales: positive affect (e.g. proud) and negative affect (e.g. ashamed). Respondents indicate how they usually feel on a 5-point Likert-type scale. In this study, the Spanish version was used (Sandín et al. 1999). Cronbach's alpha for the original scale ranged from .86 to .90 for positive affect and from .84 to .87 for negative affect, and in this sample, they were .89 for positive affect and .86 for negative affect.

Happiness Measures (HM; Fordyce 1988). It is a measure of the intensity and quantity of happiness. It is a short, two-item scale that includes an 11-point Likert scale on which respondents rate to what extent they usually feel happy or unhappy from 0 *extremely unhappy* to 10 *extremely happy* ("happiness intensity") and a question about the total percentage of time spent being happy, unhappy, and neutral ("percentage estimates") Reliability scores have been found to be acceptable in different studies (Fordyce, 1988). A combination score was calculated using the following formula as an overall happiness score (Fordyce 1988):

$$\text{Overall happiness score} = \frac{(\text{happiness intensity} \times 10) + \text{happy percentage}}{2}$$

Beck Depression Inventory II (BDI-II; Beck, Steer and Brown 1996). It is one of the most widely used measures of depression. It consists of 21 items that ask about the presence of depressive symptoms in the past two weeks. Participants can respond with more than one option per item, and the total score is calculated by adding together the highest scores of each item. In this study, the Spanish version was used (Sanz, Navarro and Vázquez 2003). Cronbach's alphas in most studies range from 0.83 to 0.96 (Wang and Gorenstein 2013), and an alpha of .86 was found in this sample.

2.3. Procedure

Participants were recruited using two methods: the snow-ball procedure through an online survey (N = 367) and students enrolled in classes in several public universities in Spain through a paper and pencil survey (N = 124). All participants signed an informed consent before filling out the questionnaires. No exclusion criteria were considered, but it was necessary to be over 18 years old and a Spanish-speaker to be enrolled in the study.

2.4. Data analyses

Statistical analyses were conducted using SPSS for Windows (version 24) and Mplus (version 6.12) (Muthén and Muthén 2011). To analyze the psychometric properties of the TSWLS, a Confirmatory Factor Analysis (CFA) was carried out. The specified model (3-factor model) was based on previous studies (Pavot et al. 1998; McIntosh 2001; Ye 2007). The normality of the sample was analyzed, verifying skewness values ≤ |2| and kurtosis values ≤ |7| (West, Finch and Curran 1995). Given the normality of the sample, the method used was Maximum Likelihood (ML) (Fabrigar, Wegener, MacCallum and Strahan 1999). In order to analyze the goodness of the model fit, several indices were used: Root Mean Square Error of Approximation or RMSEA (where a value of 0.05 or lower

indicates a good fit, values up to 0.8 indicate acceptable fit, and values up to 0.10 indicate marginally acceptable fit), Comparative Fit Index or CFI and Tucker-Lewis Fit Index or TLI (where values above 0.9 indicate acceptable fit on both indices), and Root Mean Square Residual or SRMR (where values under 0.9 indicate an acceptable fit) (Abad et al. 2011). Finally, the internal consistency of the scale was assessed using Cronbach's alpha coefficient.

The roles of gender and age were also analyzed. Regarding age, the sample was divided into four development stages (Arnett 2000; Steger, Oishi and Kashdan 2009): emerging adults (18 – 24 years old), young adults (25 – 44), middle-aged adults (45-64), and older adults (65 years or older). A mixed 4x2x3 ANOVA was conducted, with developmental stages and gender as between-factors, and the different time axes (past, present, and future LS) as within-factor. Pairwise comparisons using Bonferroni adjustment were conducted when significant effects were found.

Finally, to explore the relationship between temporal LS and mood, bivariate correlations using Pearson's correlation and stepwise multiple regression analyses were performed between past, present, and future LS and positive and negative affect (PANAS; Watson et al. 1988), happiness (HM; Fordyce 1988) and depressive symptoms (BDI-II; Beck et al. 1996).

3. Results

3.1. Confirmatory Factor Analysis (CFA)

Means (M), Standard Deviations (SD), and Skewness and Kurtosis indexes for all the items and subscales are shown in Table 1. Fit indices from the CFA with a 3-factor structure showed an adequate model fit (RMSEA = 0.099; CFI = 0.911; TLI = 0.893; SRMR = 0.066). Standardized factor loadings of the TSWLS items were all significant ($p < .05$), ranging from .48 to .91, and all factors were significantly inter-correlated ($p < .05$) (see Figure 1).

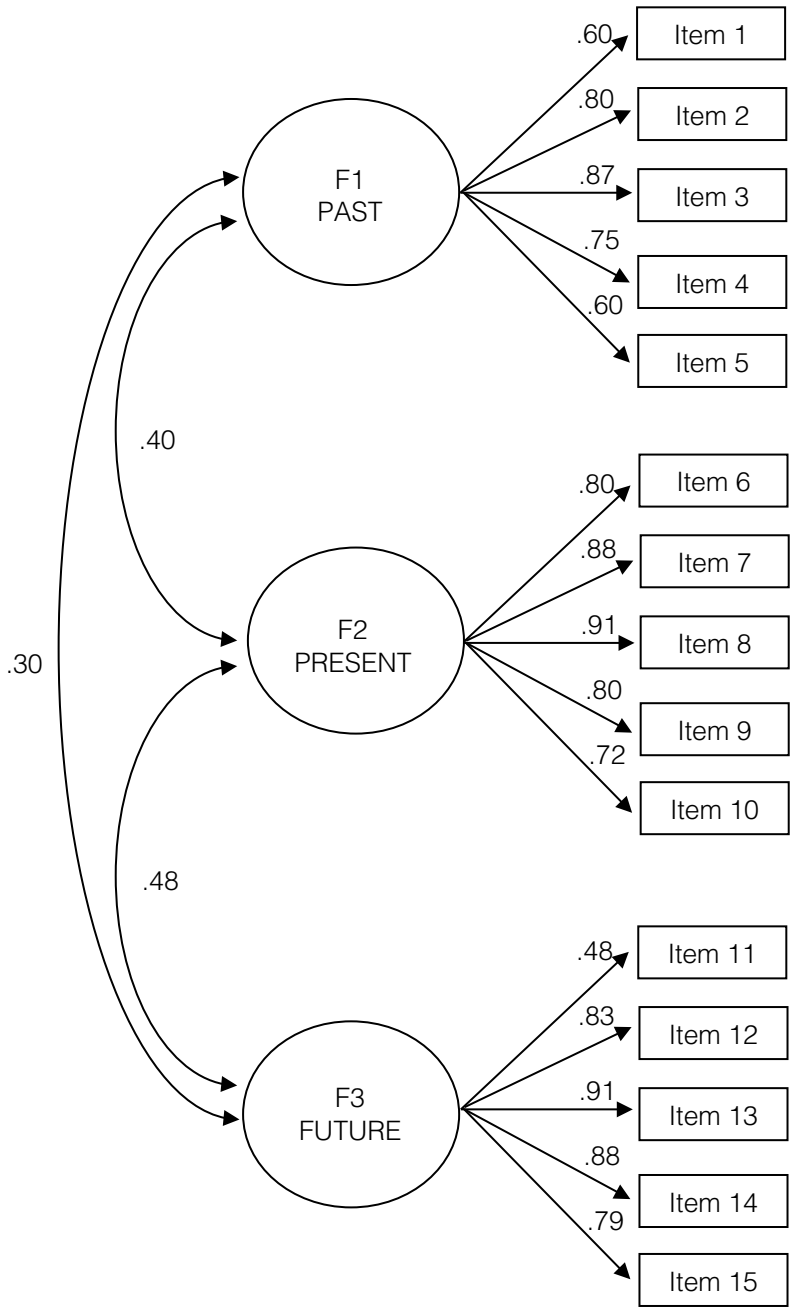
All Cronbach's alpha values showed good internal consistency: the alpha coefficient for the overall scale was high (α = .89), as were those for the subscales of the past (α = 0.84), present (α = 0.91), and future LS (α = .87).

Table 1. Mean (M) and Standard Deviation (SD), Skewness and Kurtosis indexes for all items and subscales.

TSWLS	Range	M (SD)	Skewness	Kurtosis
Item 1	1 – 7	4.07 (1.87)	-.056	-1.213
Item 2	1 – 7	4.84 (1.56)	-.641	-.479
Item 3	1 – 7	4.03 (1.67)	-.076	-.883
Item 4	1 – 7	4.33 (1.72)	-.174	-.942
Item 5	1 - 7	5.10 (1.55)	-.724	-.203
Past LS	5 – 35	22.38 (6.56)	-.230	-.495
Item 6	1 – 7	4.59 (1.73)	-.289	-1.015
Item 7	1 – 7	5.33 (1.48)	-1.008	.417
Item 8	1 – 7	4.77 (1.55)	-.524	-.607
Item 9	1 – 7	4.80 (1.62)	-.616	-.429
Item 10	1 – 7	5.53 (1.41)	-1.158	1.004
Present LS	5 – 35	25.03 (6.68)	-.614	-.345
Item 11	1 – 7	3.86 (1.57)	.012	-.574
Item 12	1 – 7	5.01 (1.27)	-.363	-.080
Item 13	1 – 7	4.96 (1.25)	-.169	-.256
Item 14	1 – 7	4.76 (1.20)	-.105	.035
Item 15	1 – 7	5.10 (1.27)	-.340	-.133
Future LS	5 – 35	23.68 (5.33)	-.107	.134

Notes: TSWLS = Temporal Satisfaction With Life Scale. LS = Life satisfaction

Figure 1. Confirmatory factor model for the Temporal Satisfaction With Life Scale



3.2. Differences in past, present, and future LS depending on gender and age

Means (M) and Standard Deviations (SD) of past, present, and future LS divided into gender and developmental stages are shown in Table 2. Mauchly's test indicated that the assumption of sphericity had been violated for the main effect of time, $X^2(2) = 0.95$, $p < .001$; therefore, degrees of freedom were corrected using the Greenhouse-Geisser estimation of sphericity ($\varepsilon = 0.95$).

Table 2. Mean (M) and Standard Deviations (SD) for past, present, and future life satisfaction divided into sex and developmental stages.

	% (N)	Past LS M (SD)	Present LS M (SD)	Future LS M (SD)
Sex				
Male	25.5 (125)	21.84 (6.51)	24.50 (7.04)	23.55 (5.42)
Female	74.5 (366)	22.56 (6.58)	25.22 (6.56)	23.72 (5.32)
Developmental stage (age range)				
Emerging adults (18 – 24)	45.1 (222)	22.83 (6.60)	25.36 (6.46)	24.51 (5.25)
Young adults (25 – 44)	33.6 (166)	22.22 (6.38)	24.22 (6.89)	23.42 (5.16)
Middle-aged adults (45 – 64)	16.6 (81)	21.90 (6.54)	25.05 (6.99)	21.79 (5.39)
Older adults (> 65)	4.5 (21)	20.67 (7.80)	27.67 (5.46)	23.48 (5.91)

Notes: LS = Life satisfaction

There was a main effect of the temporal axis (past, present, and future) on LS, $F(1.90, 917.25) = 27.75$, $p < .001$, $\eta^2_p = .05$. Pairwise comparisons showed that, in the entire sample, present LS ($M = 25.03$, $SD = 6.68$) was higher than future LS ($M = 23.68$, $SD = 5.33$), and both were higher than past LS ($M = 22.38$, $SD = 6.56$).

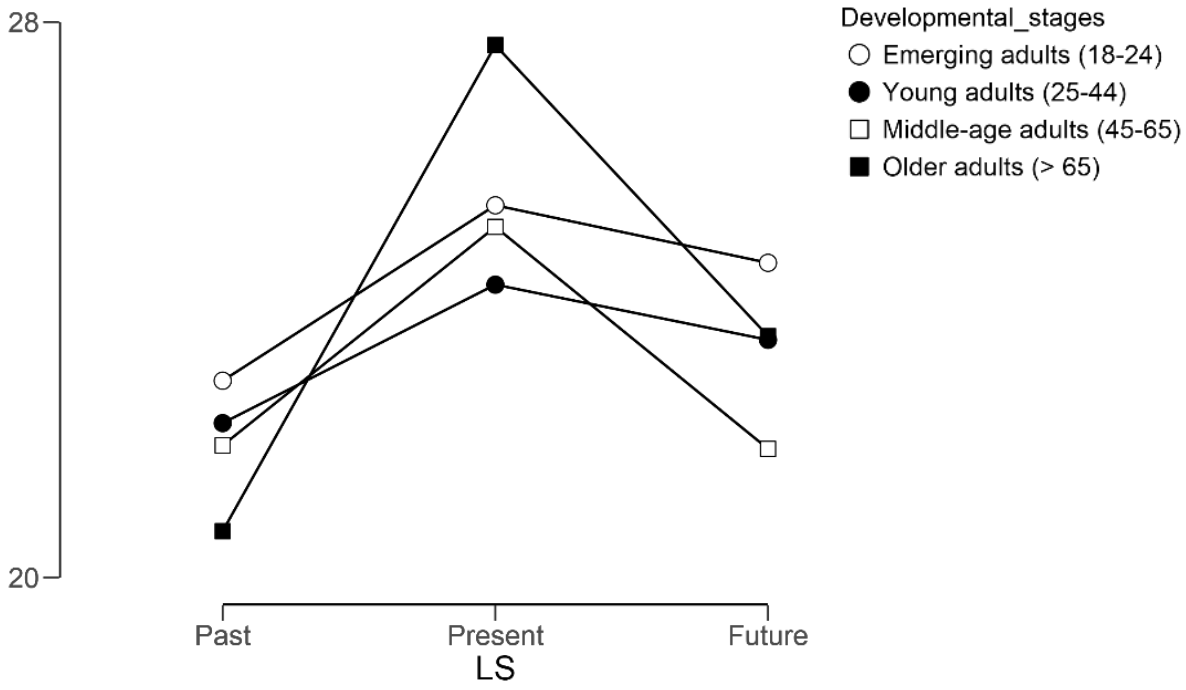
A significant interaction effect between the temporal axis and the developmental stage was found, $F(5.71, 917.25) = 2.17$, $p = .047$, $\eta^2_p = .01$. Pairwise comparisons indicated that emerging adults (18-24 years old) showed higher future LS than middle-aged adults (45-64 years old) ($p = .013$).

Regarding the divergence in the time frames of the TSWLS in each developmental stage (see Figure 2), pairwise comparisons indicated that all participants showed higher levels of present LS than past LS ($p < .05$ in all cases). Older participants (both middle-aged adults and older adults) showed higher levels of present LS than future LS ($p < .001$ and $p = .005$, respectively). Only emerging adults showed higher levels of future LS than past LS ($p = .001$).

Finally, no significant interactions were found between the time axis (past, present, and future LS) and gender, $F(1.90, 917.25) = 0.53$, $p = .580$, $\eta^2_p = .00$, or between the time frame, age, and gender, $F(5.71, 917.25) = 0.49$, $p = .816$, $\eta^2_p = .00$[1].

[1] No gender differences were found, controlling for age, F(1.90,974) =0.69, p =.498, η = .00

Figure 2. Levels of past, present, and future LS (life satisfaction) across different developmental stages



3.3. Temporal LS and its relationship with mood

Bivariate Pearson's correlations for the different time axes of LS, happiness, depression, and positive and negative affect can be found in Table 3. On the one hand, positive significant correlations were found between the three axes (past, present, and future LS) and happiness and positive affect. Regarding happiness, correlations were small in the case of past LS, moderate in the case of future, and large in the case of present LS (Cohen 1988). Regarding positive affect, moderate correlations were found with past, present, and future LS. Furthermore, negative significant correlations were found between the three axes (past, present, and future LS) and depression and negative affect. According to Cohen (1988), all correlations were small, except the one between present LS and depression, which was moderate.

Table 3. Bivariate Pearson's correlations between the Temporal Satisfaction With Life Scale and mood measures (happiness, positive affect, negative affect, and depressive symptoms)

	Past LS	Present LS	Future LS
Happiness (HM)	.247**	.533**	.366**
Positive affect (PANAS)	.301**	.432**	.339**
Negative affect (PANAS)	-.113*	-.280**	-.200**
Depression (BDI-II)	-.164*	-.451**	-.258**

Notes: $*p < .05$; $**p < .01$. LS = Life Satisfaction; HM = Happiness Measures; PANAS = Positive and Negative Affect Scale; BDI-II = Beck Depression Inventory II.

Multiple stepwise regression analyses were performed to evaluate whether mood variables predicted past, present, and future LS. The Variance Inflation Factor ranged from 1 to 1.496, indicating no problems with multicollinearity (Bowerman and O'Connell 1990; Myers 2000). Happiness, depressive symptoms, positive affect, and negative affect were entered simultaneously. Only positive affect remained as a significant predictor of past LS ($\beta = 0.283$, $t = 4.581$, $p < .001$), and this model was statistically significant, $F(242) = 20.988$, $p < .001$, $R^2 = .080$, $R^2_{Adjusted} = .076$, explaining 7.6% of the variance. Regarding present LS, a first model included only happiness ($\beta = .552$, $t = 10.264$, $p < .001$) and was statistically significant $F(242) = 105.349$, $p < .001$, $R^2 = .304$, $R^2_{Adjusted} = .301$, explaining 30.1% of the variance. However, a second model was also significant $F(242) = 60.766$, $p < .001$, $R^2 = .336$, $R^2_{Adjusted} = .331$, explaining 33.1% of the variance. In this model, happiness ($\beta = .435$, $t = 6.927$, $p < .001$) and depressive symptoms ($\beta = -.214$, $t = -3.401$, $p = .001$) were the significant predictors. Finally, for future LS, a first model included only happiness ($\beta = .335$, $t = 5.514$, $p < .001$) and was statistically significant $F(242) = 30.408$, $p < .001$, $R^2 = .112$, $R^2_{Adjusted} = .108$, explaining 10.8% of the variance. However, a second model was also significant $F(242) = 17.431$, $p < .001$, $R^2 = .127$, $R^2_{Adjusted} = .120$, explaining 12% of the variance. In this model, happiness ($\beta = 0.294$, $t = 3.377$,

p = .001) and positive affect (β = .149, t = 2.017, p = .045) were the significant predictors.

4. Discussion

The purpose of this study was to replicate the three-factor structure of the TSWLS (Pavot et al. 1998), to shed light on the patterns of past, present, and future LS in a general sample attending to possible differences depending on gender and age, and to explore the relationships between past, present, and future LS and mood (happiness, depression, and positive and negative affect).

The Spanish version of the TSWLS showed the same three-factor structure as in previous studies (McIntosh 2001; Pavot et al. 1998; Ye 2007). Only one fit index showed low acceptability (TLI = 0.893) and all the subscales showed good internal consistency. Regarding the item loadings, only item #11 ("I will change nothing about my future") showed a smaller factor loading (.48), compared to the rest of the items (which ranged from .60 to .91). This item has also shown a similar pattern in previous studies (McIntosh 2001; Tomás et al. 2016; Ye 2007), hence it is possible that its content may contribute to some measuring error. It refers to the possibility of changing some aspects of one's future life. Contemplating this possibility may not reflect the expectation of being satisfied or unsatisfied with one's life, as one can expect to be satisfied, but also feel empowered to improve things in one's future life.

According to the analyses, all participants were more satisfied with their present than with their future life. Past life satisfaction showed the lowest level compared to the other time axes. These results are distinct from previous studies carried out with young samples (Pavot et al. 1998 Study 1; Ye 2007), where future LS was higher than past and present LS, and similar to others carried out with older adults (Pavot et al. 1998 Studies 2 and 3), where present LS was higher than past and future LS. This might be due to the different age ranges included in the studies, as it seems that when older participants are included, present LS scores

are higher than future LS scores. The obtained outcomes can be attributed to both men and women since no gender differences were found, which goes in line with previous studies (McIntosh 2001; Pavot et al. 1988).

Regarding age, no differences were found in past and present LS, but younger respondents (emerging adults, from 18 to 24 years old) showed higher levels of future LS than older ones (middle-aged adults, from 45 to 65 years old). When analyzing divergences in the three temporal frames within the developmental stages, middle-aged and older adults (that is, people 45 years old and up) showed higher levels of present LS than future LS. These differences were not found in the younger groups (up to 44 years old). Emerging adults were the only group that showed higher satisfaction with their future life compared to their past life. These results go in line with the aforementioned previous studies, in which older participants seem to present higher scores of LS in their present, whereas young participants obtain higher scores in future LS (Pavot et al. 1998; Ye 2007). In addition, participants from each developmental stage separately were more satisfied with their present life than with their past life. These results lead to conclude that people generally tend to be more satisfied with the life they are living in the current moment than with their past life. However, regarding future LS, there are relevant differences between young and older adults. Results suggest that young adults expect to be just as satisfied with their future life as they are with their current life: they think it will be at least as good as it is in the present moment. However, older adults may consider the current moment as the best part of their life and do not expect a better life in the future. Older participants might have appraised their future life satisfaction anticipating the normative changes expected in late life, which may include possible deterioration in their health and autonomy, or personal losses.

With respect to the relationship between past, present, and future LS and mood, results coincide with other studies that used overall LS measures (Diener and Seligman 2002; Pavot and Diener 2008) and temporal LS studies (Pavot et al. 1998, Sailer et al. 2014): past, present, and future LS showed positive significant

correlations with positive mood (happiness and positive affect), and negative significant correlations with negative mood (depressive symptoms and negative affect). It is worth noting that these correlations were larger in the case of present LS, compared to past and future LS. These results go in line with the results of Salier and colleagues (2014) and could be explained by the fact that mood measures also refer to the present moment, and the association between current positive mood and LS (Kuppens et al. 2008). In addition, regression analyses shed light on the influence of mood on the levels of past, present, and future LS. Positive affect predicted both past and future LS, but it did not predict present LS, whereas happiness added a small percentage of variance in the case of future LS, but it explained a high level of variance (30%) in present LS. Depressive symptoms added a small percentage to present LS and did not explain neither past or future LS, and negative affect did not predict any level of LS. These results point out that happiness plays an important role on present LS predicting a high level of variance, whereas positive affect, although strongly correlated, does not predict present LS but does predict past and future LS. In the case of negative mood, only depressive symptoms seem to predict a small portion of present LS, and negative affect did not contribute to any prediction. This result goes in line with previous studies, showing that positive affect is more strongly related to global LS than negative affect (Kuppens et al. 2008). Therefore, the level of happiness of participants seemed to be the best predictor of how satisfied they were with their current lives (explaining 30% of the variance), and to a lesser degree, with their future lives. Moreover, the frequency with which they experienced positive emotions influenced how satisfied they felt with their past and future lives. Conversely, negative mood did not seem to have an influence on temporal LS predictions, although depressive mood seemed to have a slight effect when participants assessed their present LS.

This study has some limitations that should be pointed out, especially regarding the sample. First, although there were no significant gender differences, females were overrepresented in this study (74.5%), and participants 45 years old or older constituted only 21.1% of the sample. In addition, socioeconomic status

and other demographic variables were not considered. In line with this, the sample included mainly Spanish participants (89%), but it also included participants from other European and Latin American countries. It is possible that these sociodemographic variables could have led to some biases in the results, although it is unknown whether it was the case, and if true, in which direction, given that there are no theories that explain how these variables can affect the temporal satisfaction with life. Future studies are needed to address this issue.

To sum up, this work replicated the three-factor structure of the TSWLS in a Spanish-speaking sample. Generally, present LS was found to be higher than future LS, and both were significantly higher than past LS. No gender differences were found, but the data pointed to interesting results for age. Middle-aged and older adults showed lower future LS than present LS, whereas emerging and young adults did not show these differences. In addition, emerging adults scored higher on future LS than middle-aged adults. Regarding the relationship between temporal LS and mood, happiness emerged as the best predictor of present LS, and positive affect only predicted past and future LS. On the other hand, negative mood measures (negative affect and depressive symptoms) did not play an important role in temporal LS predictions.

The results obtained in this work can have important implications for different psychology areas. As previously stated, results on age differences highlight the importance of including the time factor when assessing LS, especially in areas such as developmental psychology. The data point out the importance of including the temporal aspects when LS is measured. Otherwise, relevant information could be missed or even distorted. For instance, in the case of older adults, lower levels of future LS can influence the overall score of LS, perhaps producing lower rates of LS that are not necessarily a reflection of their satisfaction with their current lives. If temporality is not considered when measuring the levels of LS in the elderly, it will not be possible to know whether a low global score of LS was influenced by low levels of future LS that are not

necessarily low in their satisfaction with their present or past life. LS is also a construct strongly associated with mental health. Even the temporal focus of the main symptoms can be different through different disorders: while anxiety patients are worried about their future, depressive patients tend to ruminate about their past. To distinguish between the three components of LS can provide a better understanding of these clinical conditions. In addition, it can help practitioners to assess the course of the therapy, providing a more precise measure of LS which could permit them to focus on the temporal frames that are more relevant to the symptomatology of their clients. In the same line, it can be highly pertinent in the development of evidence-based therapies, as it can provide valuable information for the efficacy tests of different psychological treatments. To finish, results obtained in this study are consistent with the field of positive psychology, where wellbeing is pursued not only through the treatment and prevention of negative emotions and mental illnesses, but also through the active pursuit of happiness and positive emotions (Seligman and Csikszentmihalyi 2000). Measures that provide more accurate information about one of the main components of wellbeing (i.e. LS) can make an important contribution to this emerging field. In addition, it can be especially helpful in the area of positive psychology interventions, which are specific activities designed with the aim of positive psychology. Many efficacy studies have been carried out to test whether these interventions are able to significantly improve participants' levels of wellbeing through self-report measures that assess, among others, life satisfaction (Bolier et al. 2013). In this sense, to consider the temporal aspects of LS can contribute to a more precise assessment on their efficacy.

In conclusion, as previously mentioned, it is highly convenient to discern between different time frames to assess a broad construct as LS, and to consider how the temporal focus can have different effects on wellbeing. To incorporate the temporal aspects of LS on its assessment will contribute to a better understanding of an essential constituent of wellbeing.

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Appendix. Temporal Satisfaction With Life Scale (Spanish version)

Las siguientes afirmaciones se refieren a su pasado, presente o futuro. Usando la escala que se presenta a continuación, indique su grado de acuerdo o desacuerdo con cada una de ellas:

1 = Muy en desacuerdo

2 = En desacuerdo

3 = Ligeramente en desacuerdo

4 = Ni de acuerdo ni en desacuerdo

5 = Ligeramente de acuerdo

6 = De acuerdo

7 = Muy de acuerdo

___ 1. Si tuviera que vivir mi pasado de nuevo, no cambiaría nada.
___ 2. Estoy satisfecho/a con mi vida en el pasado.
___ 3. Mi vida en el pasado fue ideal para mí.
___ 4. Las condiciones de mi vida en el pasado fueron excelentes.
___ 5. En mi pasado tuve las cosas importantes que quise.
___ 6. No cambiaría nada de mi vida actual.
___ 7. Estoy satisfecho/a con mi vida actual.
___ 8. Mi vida actual es ideal para mí.
___ 9. Las condiciones actuales de mi vida son excelentes.
___ 10. En la actualidad tengo las cosas importantes que quiero.
___ 11. No habrá nada que quiera cambiar de mi futuro.
___ 12. En el futuro estaré satisfecho/a con mi vida.
___ 13. Creo que mi vida en el futuro será ideal para mí.
___ 14. Las condiciones de mi vida en el futuro serán excelentes.
___ 15. En el futuro tendré las cosas importantes que quiera.

4

My best self in the past, present or future:

results of two Randomized Controlled Trials

This chapter is currently under review as Carrillo, A., Etchemendy, E., Baños, R. M. My best self in the past, present or future: Results of two Randomized Controlled Trials

Abstract

The Best Possible Self (BPS) intervention has already shown to be an efficacious intervention to increase wellbeing. However, little is known about the factors contributing to the efficacy of this Positive Psychology Intervention (PPI). This work aimed at exploring the role of the temporality in the efficacy of the BPS intervention. Two Randomized Controlled Trials (RCTs) were carried out in which participants (N = 112 and N = 108) were randomized to writing about their past, present or future best self or about the activities carried out during the last 24 hours (control condition). The main outcome measure was positive affect, and other measures related to wellbeing were also included (satisfaction with life, happiness, optimism, self-efficacy and self-satisfaction). It was hypothesized that all three experimental conditions would be equally effective to increase wellbeing and that they would produce larger benefits than the control condition. Results of both RCTs showed that all conditions produced significant increases on wellbeing enhancement, although no significant differences were found compared with the control condition. Within-group effect sizes suggest that the experimental conditions may be more effective than the control condition. Results obtained by the two RCTs imply that BPS can be equally effective regardless of the temporal focus. This study contributed to shed light on the mechanisms that influence the effectiveness of a widely used PPI.

1. Introduction

According to the World Health Organization (WHO, 2001), mental health is not the mere absence of mental illness, but a state of full physical, mental and social wellbeing. Therefore, it is necessary to broaden the focus of study from the alleviation of symptoms to the wellbeing promotion, and to advance in the development of new ways to enhance wellbeing. In this line, the Positive Psychology movement has offered a frame for the scientific advances of what makes people happy since its establishment in the late 90's (Seligman & Csikszentmihalyi, 2000). In this context, Positive Psychology Interventions (PPIs) emerged as plausible approaches to address this issue. They are intentional activities whose aim is to increase people's wellbeing by cultivating positive feelings, cognitions or behaviors (Mitchell, Vella-Brodrick, & Klein, 2010; Sin & Lyubomirsky, 2009).

These interventions are pretty heterogeneous (e.g. writing gratitude letters or savoring positive experiences) and they can be delivered through different methods, including Information and Communication Technologies (ICTs). Indeed, ICTs have become a valuable supporter of PPIs: merging both fields have resulted in several advantages for these interventions. An example of this association is the development of the concept "positive technologies" (PTs) (Botella et al., 2012; Riva, Baños, Botella, Wiederhold, & Gaggioli, 2012), the evidence-based approach which intends to encourage the use of technology to promote the personal growth and the development of the virtues and strengths of individuals, organizations, and society.

When PPIs are delivered through the Internet or through smartphones they are usually named as Online Positive Psychology Interventions (OPPIs). These "technological variants" of PPIs have several important advantages, as better cost-effectiveness and higher accessibility. Thus, they permit to deliver interventions at lower costs while reaching broader populations that otherwise could not have access to them. In addition, it is possible to enhance these

interventions with multimedia content and to personalize them, which make them more appealing to participants (Mitchell et al., 2010).

Research on PPIs is burgeoning, and many studies have been carried out over the last years in order to develop and validate new exercises or interventions (some of them in the form of OPPIs), demonstrating their efficacy to enhance wellbeing (Bolier et al., 2013; Sin & Lyubomirsky, 2009). Lately, because of this exponential growth in the literature about the analysis of the utility of these interventions, researchers have started to investigate which factors influence their efficacy. Some authors have developed general models trying to contribute to a better understanding of how they might work (e.g. Lyubomirsky & Layous, 2013; Quoidbach, Mikolajczak, & Gross, 2015). However, the knowledge about this question is scarce, and it is still necessary to delve into the mechanisms that might affect these interventions in order to know why they work and, therefore, make the best use of them (Bolier et al., 2013).

One of the well-established PPIs is the Best Possible Self (BPS) intervention, which asks participants to write down about themselves in a future where they have achieved everything desired after working hard towards it. The first study that used this exercise was based on the writing paradigm of Pennebaker (1997) and compared the new intervention (writing about one's best possible self in the future) to writing about a past traumatic event (King, 2001). Similar effects were found on both disclosive writing and BPS, being both beneficial on health, feelings of happiness and positive affect. Interestingly, BPS was rated as significantly less upsetting by participants that trauma writing.

Since the first work by King (2001), a large number of studies with different characteristics have been carried out to evaluate the efficacy of this intervention. Some studies applied the exercise individually in person (e.g. Enrique, Bretón-López, Molinari, Baños, & Botella, 2017; Ng, 2016), whereas others implemented it in small groups (e.g. Sheldon & Lyubomirsky, 2006). It has also been applied in laboratory contexts as an optimism inductor (e.g. Boselie, Vancleef, & Peters, 2016; Manthey, Vehreschild, & Renner, 2016), and other studies have used an

online format to deliver it (e.g. Layous et al., 2013; Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011). In addition, a specific visualization ingredient was added in some recent works. There is empirical evidence of the advantages of imagery or visualization on emotional processing, which seems to have a powerful impact on positive emotion processing in comparison with solely writing or talking (Holmes, Arntz, & Smucker, 2007). Although BPS encourages participants to visualize one's best possible future, the imagery component was not explicit in many studies. For this reason, some authors added specific visualization instructions to the original BPS exercise, enriching the intervention with mental imagery (e.g. Enrique et al., 2017; Meevissen, Peters, & Alberts, 2011; Odou & Vella-Brodrick, 2013).

Recently, a meta-analysis about the efficacy of BPS that included 28 studies (N = 2,863) indicated that BPS can produce significant increases on wellbeing in comparison with controls (Carrillo, Rubio-Aparicio, et al., 2018). Effect sizes found in this meta-analysis were similar as the ones obtained in the last meta-analysis about PPIs in general (Bolier et al., 2013) for wellbeing (d = .38), optimism (d = .28), and negative affect (d = .41), and larger in the case of positive affect (d = .66). Surprisingly, moderator analyses, which included different variables related to the implementation of the intervention (e.g. length, dosage, or delivery method) and the individuals' characteristics (e.g. age, country of origin clinical) found no significant results. That is, none of the moderators comprised in the meta-analysis emerged as significant factors on the efficacy of the intervention. Hence, the aspects of the intervention that might take part in its efficacy are still unclear.

It has been proposed that the activation of positive self-relevant information might be one of the main factors on the efficacy of some PPIs (Mongrain & Anselmo-Matthews, 2012). BPS consists of, precisely, activating a positive content regarding one's self-concept. Concretely, this content is future-oriented. Indeed, BPS has been widely categorized as a future-oriented PPI (e.g. Malouff & Schutte, 2016). However, it is unknown whether the future focus is an essential

component of its efficacy. Although it has been suggested that temporality may be one of the mechanisms of action of the PPIs (Lyubomirsky & Layous, 2013; Wellenzohn, Proyer, & Ruch, 2016), it is uncertain whether this temporal orientation is an essential constituent of the intervention, as this factor has not been previously tested. In fact, as aforementioned, this intervention was compared to a writing intervention that focused on the past (a traumatic event) in the original work by King (2001) in which this PPI was first tested. Within the field of PPIs, there are numerous interventions with other temporal foci which have shown to be efficacious to increase wellbeing, as past-focused PPIs about writing about positive emotional experiences (e.g. Baikie, Geerligs, & Wilhelm, 2012; Burton & King, 2004), and present-focused PPIs as performing daily acts of kindness (Curry et al., 2018) or savoring the moment (Hurley & Kwon, 2012). However, these interventions are not only distinguishable by their temporal focus, but also by their content. Thus, they are not directly comparable.

In order to determine the role that temporal focus has on the efficacy of the interventions, it would be necessary to directly manipulate it. As far as we know, only one study explicitly tested the role of time on the efficacy of a PPI: Wellenzohn and colleagues (2016) manipulated the time focus of a humor-based intervention that consisted of writing three funny things each day for a week (which happened during last week, during the current day or that could happen in the future). They found that all three temporal variants produced similar increases in happiness and decreases in depressive symptoms.

As previously stated, BPS is a specifically future-oriented PPI grounded on positive writing about oneself in the future. However, it is unknown whether the temporal focus of this intervention is a relevant factor on its efficacy, or whether it is sufficient to promote a positive outlook of oneself without regard to the temporal frame in which it is constructed. Therefore, the purpose of this work is to evaluate the efficacy of writing about one's best self in the past, present or future on wellbeing levels compared with a control condition. With this aim, the original BPS instructions were altered in order to modify the temporal focus of

the intervention to the past (Best Past Self or BPAS) or the present (Best Present Self or BPRES). Based on the previous findings, it was hypothesized that all experimental conditions (past, present, and future) would be effective in improving wellbeing measures and that they would produce higher increases in wellbeing measures than the control condition. The main outcome measure included in this work was positive affect as it has been widely used in previous studies (Carrillo, Rubio-Aparicio, et al., 2018). However, given the exploratory nature of this study, other relevant measures related to wellbeing were also included to provide a more accurate assessment of the efficacy of these variants: life satisfaction, self-efficacy, happiness, optimism and self-satisfaction.

Two Randomized Controlled Trials (RCT) were carried out to compare the three variants of the BPS with an active control condition. The first RCT (Study 1, N = 112) used a blended design in which participants learned the exercise in a laboratory session and practiced the assigned intervention through Internet for one week. The second RCT (Study 2, N = 108) aimed at replicating Study 1 within a completely online procedure in a general sample. This work was registered in the United States National Institute of Health Registration System (NCT03024853) and approved by the ethical committee of the University of Valencia (H1415802387094).

2. Study 1

2.1. Method

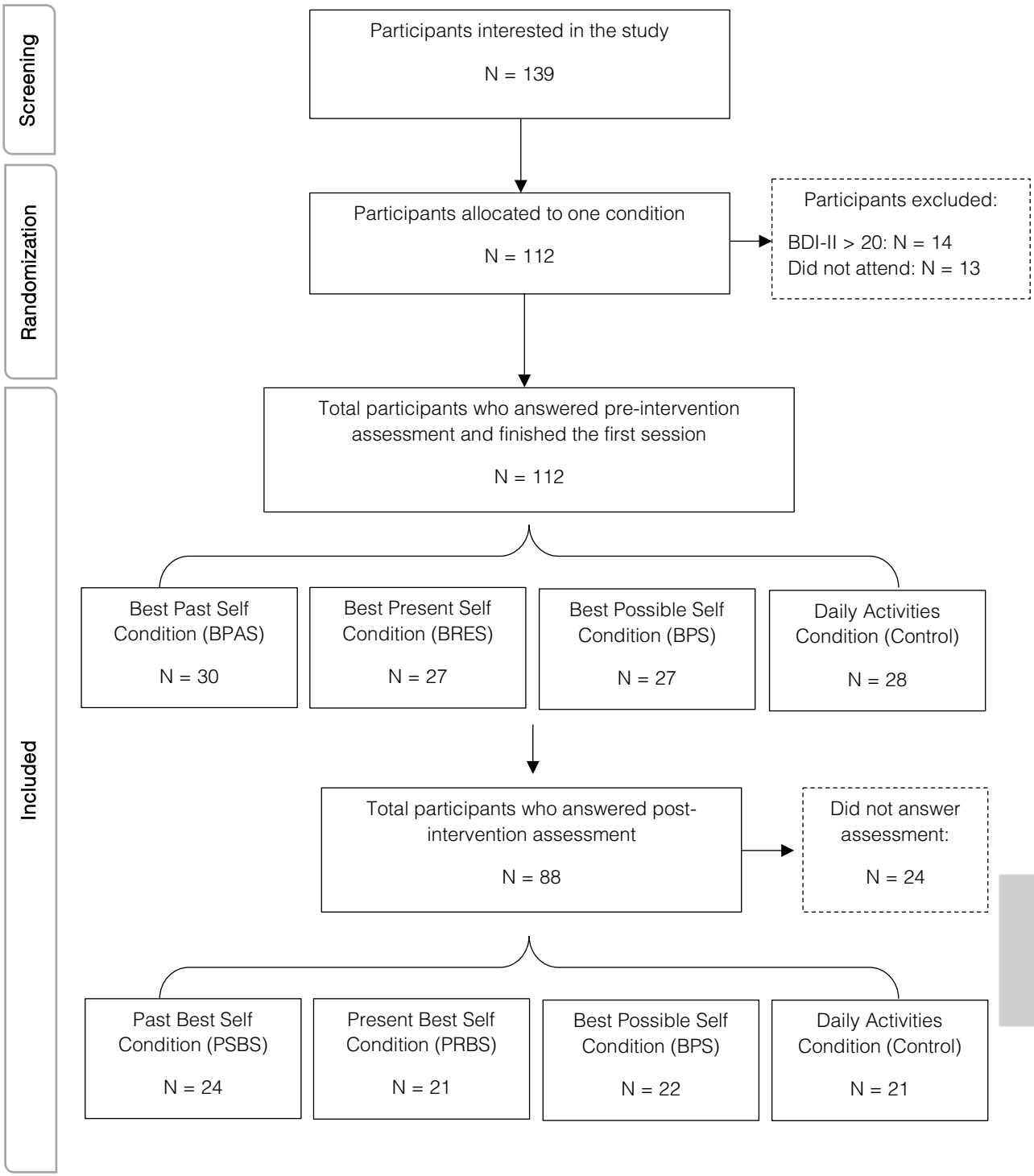
2.1.1. Participants

Participants were recruited through advertisements in a Spanish University. They were compensated with a participation in a raffle upon study completion. Exclusion criteria were to be younger than 18 years old, and the presence of moderate to severe depression measured by Beck's Depression Inventory-II, BDI-II, that is, a score of 20 or more in the scale (Beck, Steer, & Brown, 1996).

The sample size needed was determined using G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007). A total of 80 participants were estimated to be included in the sample to detect an effect size of Cohen's *d* = 0.30 on the primary outcomes, as a mean of the effect sizes found in the last meta-analysis of PPIs (Bolier et al., 2013) and BPS interventions (Carrillo, Rubio-Aparicio, et al., 2018), an alpha error of .05, and a statistical power of .80. Attrition rates ranged from 0 to 75% in the last meta-analysis of PPIs (Bolier et al., 2013). Hence, in anticipation of possible dropouts, a total of 112 participants were randomized, with the aim to preserve the statistical power in case of withdrawals.

Participants were randomized to one of four conditions (BPAS = 30, BPRES = 27, BPS = 27, Control = 28, see "Interventions" for a detailed description) with a randomized sequence created with the software Random Allocator Software 2.0 package (Saghaei, 2004). This random sequence was checked by the first author (AC) each time a participant came to the laboratory to conduct the first session, in order to allocate them to the assigned condition. Participants were not aware of their condition status (if they were in an experimental or control condition). Given the nature of the intervention, blinding of the researcher was not feasible. The initial sample (pre-intervention assessment) was composed by 112 participants (86 women) aged from 18 to 40 years old (M = 21.76, SD = 3.63). The mean score in the BDI scale was low (M = 6.95, SD = 4.57, range from 0 to 19). Finally, 88 participants (69 women) between 18 and 40 years old (M = 21.64, SD = 3.66) answered the post-intervention assessment. Intention-to-treat analyses permitted to carry out the analyses with the 112 participants who started the intervention. For more information, see Figure 1.

Figure 1. Flow of participants in Study 1



2.1.2. Interventions

Participants were informed they would take part in a study about *the power of imagination* (Meevissen et al., 2011) and that they would learn an exercise that could improve their wellbeing levels. All participants received the same message, so all of them (including control condition) had the same expectancies about the possible effects of the intervention.

The BPS condition consists of visualizing oneself in the future after everything has gone as it possibly could (King, 2001; Meevissen et al., 2011; Sheldon & Lyubomirsky, 2006). In addition, two variants of this exercise were designed for this study, resulting in three experimental conditions. These variants had the same format and instructions as the original BPS intervention, and only the temporal frame was modified.

The Best Past Self condition (BPAS) consisted of recalling and visualizing oneself in a time in the past when they considered they displayed the best version of themselves, focusing on the objectives they attained and the best features they had. The Best Present Self condition (BPRES) consisted of visualizing themselves in the present, concretely, the best version they offered to the world, focusing on the objectives they were attaining at that moment and the best features they had. Finally, the control condition consisted of writing down and visualizing the activities they did during the last 24 hours (Enrique, Bretón-López, Juana; Molinari, Baños, & Botella, 2017; Meevissen et al., 2011; Sheldon & Lyubomirsky, 2006). Annexes 1 and 2 provide the transcriptions of the audio instructions of each condition.

All conditions included an explicit visualization component, and without regard to the condition, participants were encouraged to write down for 15 minutes, and then to visualize the elaborated content for 5 minutes. As it was expected that not all participants had previous experience with imagining exercises, all of them practiced a brief visualization exercise about cutting a lemon before the

assigned exercise (Holmes, Coughtrey, & Connor, 2008; Meevissen et al., 2011). Transcription of the audio instructions of this exercise can be found in Annex 3.

2.1.3. Technologies

Experimental conditions were implemented through ICTs. Participants in the experimental conditions wrote about their best self in a PowerPoint template with a book theme (in which each slide looked like a page of a book). They also added a song for this content (from the catalog of YouTube webpage), and a researcher prepared a video with the written text and the music. After elaborating their essay, participants watched the video, in which they listened to the song and could read their essay. The text appeared for approximately 3 minutes and, then, a blank page was on the screen for 2 minutes (with the message: “continue visualizing”) meanwhile the song could still be heard. This procedure was chosen with the purpose that participants could read the text, and then they could completely focus on their visualization meanwhile listening to the song. This multimedia content was uploaded a web platform in which participants had online access to their video through a personal user and password (Quero, Molés, Pérez-Ara, Botella, & Baños, 2012). Given that the content of the texts in the control condition would different every day (i.e. the activities participants did during the last 24 hours) it was not possible to make a video in advance and upload it to the web platform. For this reason, the control condition was implemented as in previous BPS studies (e.g. Meevissen et al., 2011; Sheldon & Lyubomirsky, 2006). All participants received reminders through e-mail every day, in which the instructions for the daily practice were included.

2.1.4. Measures

Screening:

Depression. In order to measure depression severity, the Beck Depression Inventory II (BDI-II; Beck et al., 1996) was used as a screening. This is one of the most widely used measures of depression, comprised of 21 items about the presence of depressive symptoms during the past two weeks. Scores of this scale can be categorized into four levels of depressive severity: 0-13 minimal or no depression; 14-19 mild depression, 20-28 moderate depression, and 29-63 severe depression. In this study, a Spanish version was used (Sanz, Navarro, & Vázquez, 2003). Cronbach's alphas in most studies range from 0.83 to 0.96 (Wang & Gorenstein, 2013). In this sample, an α = .74 was found.

Primary outcome:

Positive and negative affect. The Positive and Negative Affect Scale, PANAS (Watson, Clark, & Tellegen, 1988) was used to assess this construct. This is a 20-item scale that measures positive and negative mood. It contains two subscales: positive affect (with 10 positive emotions, e.g. "inspired"), and negative affect (with 10 negative emotions, e.g. "ashamed"). Respondents rate how they usually feel on a 5-point Likert-type scale. In this study, a Spanish version was used (López-Gómez, Hervás, & Vázquez, 2015). Cronbach's alpha for the original scale ranged from .86 to .90 for positive affect and from .84 to .87 for negative affect, and it was equal to .90 for positive affect and .85 for negative affect in this study.

Secondary outcomes:

Life satisfaction (LS). In this study, the Temporal Satisfaction with Life Scale, TSWLS (Pavot, Diener, & Suh, 1998). This scale measures past, present, and future LS. It contains 15 items divided into three subscales: past life LS (items 1-5), present LS (items 6-11), and future LS (items 12-15). It is also possible to calculate a global LS score by adding all the items together. Respondents rate

their agreement with each sentence on a 7-point Likert style scale (1 “strongly disagree” to 7 “strongly agree”). In this study, a Spanish version was used (Carrillo, Etchemendy, & Baños, 2018). Cronbach’s alphas for the complete scale ranged from .91 to .93 in the original studies (Pavot et al., 1998). In this study, Cronbach’s alpha was .82 for the past LS subscale, .89 for the present LS subscale, and .89 for the future LS subscale.

Happiness. The Happiness Measures, HM (Fordyce, 1988) was included. This is a two-item scale that measures intensity and quantity of happiness. Respondents rate to what extent they usually feel happy or unhappy in an 11-point Likert scale (from 0 “extremely unhappy” to 10 “extremely happy”) and the total percentage of time spent being happy, unhappy, and neutral. An overall happiness score can be calculated with these two items. Reliability scores have been found to be acceptable in different studies (Fordyce, 1988).

Self-efficacy. The New General Self-Efficacy Scale, NGSES (Chen, Gully, & Eden, 2001). In this scale, respondents rate their agreement with each statement on a 5-point Likert-type scale (1 “strongly disagree” to 5 “strongly agree”). Cronbach’s alphas ranged from .85 to .90 in the original studies (Chen et al., 2001). A Spanish translation of this scale was used for this study, in which an alpha of .91 was found.

Optimism. In this study, the Life Orientation Test-Revised, LOT-R (Scheier, Carver, & Bridges, 1994) was used. This scale measures dispositional optimism, that is, the general expectation for good outcomes. The scale includes 10 items that measure optimism (3 items), pessimism (3 items), and it has 4 filler items. Higher scores reflect higher levels of dispositional optimism. The Spanish version of the scale was used for this study (Otero, Luengo, Romero, Gómez, & Castro, 1998). Cronbach alpha’s in the original scale was .86, and an $\alpha = .73$ was obtained in this sample.

Self-satisfaction. An ad-hoc question was included in which participants rated their satisfaction with themselves with a Likert scale (1 “not at all” to 5 “a lot”):

"To what extent do you feel satisfied with yourself?" (Kinnunen, Laukkanen, Pölkki, & Kylmä, 2010; Twenge & Campbell, 2008). Due to technical reasons in the administration of the questionnaires (pre- and post-intervention assessment), 23 participants could not answer this scale, thus results of this measure include a final sample of N = 89 (BPAS = 23, BPRES = 19, BPS = 22, Control = 25).

2.1.5. Procedure

The intervention lasted 7 days. Participants only came to the laboratory for the first session and then practiced the exercise online during the rest of the week. In the first session, participants signed the informed consent and received audiotaped instructions of the lemon imagery exercise. Upon completion, they answered the pre-intervention assessment and, subsequently, they listened to the audiotaped instructions of the assigned exercise and received a manual with more detailed written instructions of the exercise (which also included the instructions for the remaining 6 days of practice). Then, the researcher left the room for 15 minutes to let participants write quietly, and then the researcher came back and timed 5 minutes for the visualization task (after preparing the videos in the case of the experimental conditions). In addition, participants in the experimental conditions received a username which provided them online access to their own video. A reminder to practice was sent by e-mail every day to each participant, and after 7 days, participants received an e-mail with the link of the post-intervention assessment.

2.1.6. Data analyses

Statistical analyses were conducted using the SPSS for Windows (version 24). To assess pre-post intervention changes in the outcome measures between conditions, one-way repeated measures 4x2 ANOVA with condition (past, present, future or control) as between-factor and time (pre and post-intervention)

as within-factor were performed for each measure. When a significant interaction was found, post-hoc analyses using Bonferroni adjustment were conducted to determine which group comparisons were significant. Finally, effect sizes (Cohen's *d*) and confidence intervals were calculated for within-group changes, given that effect sizes are the best indicator of the magnitude of the observed changes, essential information that cannot be obtained uniquely by focusing on p-values (Durlak, 2009).

2.2. Results

2.2.1. Preliminary analyses

T-tests, Analysis of Variance (ANOVA) and chi-square analyses on pre-intervention measures between conditions revealed no significant differences between conditions on any of the measures, indicating that randomization was successful (all *p* values > 0.05). Independent-sample t-tests on baseline scores between completers and dropouts showed no significant differences in any of the measures at baseline (all *p* values > 0.05). A conservative approach assuming no change from pre-intervention to post-intervention scores was followed, and intention-to-treat analyses were carried out through which pre-intervention scores of the dropout participants were imputed at post-intervention. Hence, all analyses included 112 participants.

2.2.2. Main analyses

Mean, standard deviations and within-group effect sizes (measured by Cohen's *d*) can be found in Table 1.

Positive affect. There was a main effect of time on positive affect $F(1,108) = 9.39$, $p = .003$, $\eta_p^2 = 0.08$, and the interaction between time and condition was not

significant $F(3,108) = 1.42$, $p = .241$. Significant within-group effect sizes were found in BPAS and BPRES conditions.

Negative affect. A main effect of time was found $F(1,108) = 4.51$, $p = .036$, $\eta_p^2 = 0.04$, and no significant interaction between time and condition was observed $F(3,108) = 0.70$, $p = .553$. In addition, a significant within-group effect size emerged BPS condition.

Life satisfaction. There was a main effect of time on past LS $F(1,108) = 18.06$, $p < .001$, $\eta_p^2 = 0.14$, present LS $F(1,108) = 4.22$, $p = .042$, $\eta_p^2 = 0.04$ and future LS $F(1,108) = 7.92$, $p = .006$, $\eta_p^2 = 0.07$. Interaction effects did not show significant differences between conditions $F(3,108) = 1.64$, $p = .184$, $F(3,108) = 1.17$, $p = .326$, and $F(3,108) = 0.25$, $p = .865$, respectively. Regarding within-group effect sizes, BPRES showed significant effect sizes for past, present and future LS, and BPS showed significant effect sizes for past LS.

Happiness. There was a main effect of time on happiness $F(1,108) = 5.16$, $p = .025$, $\eta_p^2 = 0.05$. The interaction between time and condition was not significant $F(3,108) = 0.13$, $p = .941$.

Self-efficacy. There was a main effect of time on self-efficacy $F(1,108) = 18.35$, $p < .001$, $\eta_p^2 = 0.15$, and the interaction between time and condition was not significant $F(3,108) = 1.95$, $p = .126$. Significant within-group effect sizes emerged in BPRES and BPS conditions.

Optimism. There was a main effect of time on optimism $F(1,108) = 7.18$, $p = .009$, $\eta_p^2 = 0.06$, and the interaction between time and condition was not significant $F(3,108) = 0.60$, $p = .618$. For this construct, BPS showed a significant within-group effect size.

Self-satisfaction. There was a main effect of time on self-satisfaction $F(1,85) = 22.68$, $p < .001$, $\eta_p^2 = 0.21$, and the interaction between time and condition was also significant $F(3,85) = 3.59$, $p = .051$, $\eta_p^2 = 0.09$. Post-hoc comparisons using Bonferroni correction revealed that BPRES and BPS experienced greater

increases in self-satisfaction than the control group (p = .001 and p = .002, respectively). In addition, BPRES and BPS showed significant within-group effect sizes.

2.3. Discussion Study 1

This study showed that all conditions significantly improved their levels of positive affect, happiness, self-efficacy, LS (past, present, and future), optimism and decreased their levels of negative affect. In the case of self-satisfaction, significant differences emerged among conditions: BPRES and BPS participants experienced significant improvements in their levels of satisfaction with themselves after the intervention.

Within-group effect sizes showed significant results in the experimental conditions, in contrast with the control condition. These significant effect sizes were different among the experimental conditions: according to Cohen (1988), BPAS produced a significant small to moderate effect size in positive affect; BPRES showed significant moderate effect sizes in positive affect, LS (past, present, and future) and self-efficacy, and a large effect size in self-satisfaction; and BPS produced significant moderate effect sizes in past LS, self-efficacy, optimism, self-satisfaction and negative affect (in this case, as a decrease). In the case of control condition, no significant within-group effect sizes were found.

These results partially confirmed the hypotheses of this work: on the one hand, all experimental conditions were able to increase wellbeing levels, but no statistically significant differences emerged between control and experimental conditions except for the self-satisfaction, in which BPRES and BPS were able to increase their levels.

Table 1. Means (M) and standard deviations (SD) and within-group effect sizes (Cohen's d) of participants in Study 1

Measure	Condition	N	M (SD) Pre	M (SD) Post	Within-group effect size, d [95% CI] Pre-post intervention
Positive Affect	BPAS	30	30.90 (7.04)	32.33 (7.84)	**0.40 [0.02, 0.77]**
	BPRES	27	32.48 (6.51)	35.19 (5.63)	**0.54 [0.13, 0.94]**
	BPS	27	33.70 (7.75)	34.82 (6.00)	0.19 [-0.19, 0.58]
	Control	28	33.93 (6.12)	34.07 (7.69)	0.04 [-0.34, 0.41]
Negative Affect	BPAS	30	17.83 (4.74)	17.67 (4.08)	-0.05 [-0.40, 0.31]
	BPRES	27	17.07 (5.12)	16.00 (4.82)	-0.38 [-0.76, 0.02]
	BPS	27	17.85 (6.06)	16.74 (4.58)	**-0.40 [-0.79, -0.01]**
	Control	28	16.29 (5.03)	16.04 (4.48)	-0.07 [-0.44, 0.30]
Past Life Satisfaction	BPAS	30	22.50 (6.34)	23.83 (5.38)	0.32 [-0.05, 0.68]
	BPRES	27	21.85 (6.27)	23.85 (6.29)	**0.63 [0.21, 1.03]**
	BPS	27	20.07 (6.72)	22.74 (6.11)	**0.49 [0.08, 0.88]**
	Control	28	24.68 (7.01)	25.07 (7.05)	0.17 [-0.21, 0.54]
Present Life Satisfaction	BPAS	30	22.83 (6.41)	23.37 (6.48)	0.15 [-0.21, 0.51]
	BPRES	27	25.19 (6.99)	27.15 (6.68)	**0.47 [0.06, 0.86]**
	BPS	27	26.11 (5.97)	27.37 (4.76)	0.18 [-0.20, 0.56]
	Control	28	27.32 (6.35)	27.11 (6.01)	-0.10 [-0.47, 0.27]
Future Life Satisfaction	BPAS	30	23.70 (5.42)	24.47 (5.76)	0.19 [-0.18, 0.55]
	BPRES	27	26.44 (5.76)	28.26 (4.41)	**0.44 [0.04, 0.83]**
	BPS	27	25.44 (6.73)	26.56 (4.43)	0.17 [-0.21, 0.55]
	Control	28	25.18 (4.37)	26.50 (4.72)	0.36 [-0.03, 0.74]

Table 1. Means (M) and standard deviations (SD) and within-group effect sizes (Cohen's d) of participants in Study 1 (continued)

Measure	Condition	N	M (SD) Pre	M (SD) Post	Within-group effect size, d [95% CI] Pre-post intervention
Happiness	BPAS	30	46.30 (5.67)	47.47 (9.47)	0.12 [-0.24, 0.48]
	BPRES	27	48.70 (5.94)	51.02 (11.34)	0.23 [-0.15, 0.61]
	BPS	27	47.78 (8.59)	49.24 (9.18)	0.22 [-0.16, 0.70]
	Control	28	45.25 (7.88)	47.48 (8.28)	0.35 [-0.03, 0.73]
Self-efficacy	BPAS	30	4.03 (0.62)	4.11 (0.66)	0.28 [-0.09, 0.64]
	BPRES	27	4.18 (0.68)	4.47 (0.45)	**0.51** [0.10, 0.91]
	BPS	27	4.21 (0.49)	4.41 (0.41)	**0.63** [0.21, 1.04]
	Control	28	4.14 (0.56)	4.21 (0.56)	0.20 [-0.18, 0.57]
Optimism	BPAS	30	23.37 (4.21)	23.03 (3.79)	0.15 [-0.21, 0.51]
	BPRES	27	23.67 (3.91)	24.41 (4.14)	0.27 [-0.12, 0.65]
	BPS	27	23.19 (3.50)	24.19 (3.93)	**0.40** [0.00, 0.79]
	Control	28	24.07 (3.96)	24.36 (4.18)	0.17 [-0.20, 0.55]
Self-satisfaction	BPAS	23	3.57 (0.79)	3.74 (0.75)	0.27 [-0.15, 0.68]
	BPRES	19	3.68 (0.82)	4.22 (0.79)	**0.86 [0.32, 1.38]**
	BPS	22	3.95 (0.65)	4.36 (0.58)	**0.61 [0.15, 1.07]**
	Control	25	3.84 (0.85)	3.92 (0.91)	0.20 [-0.20, 0.59]

3. Study 2

3.1. Method

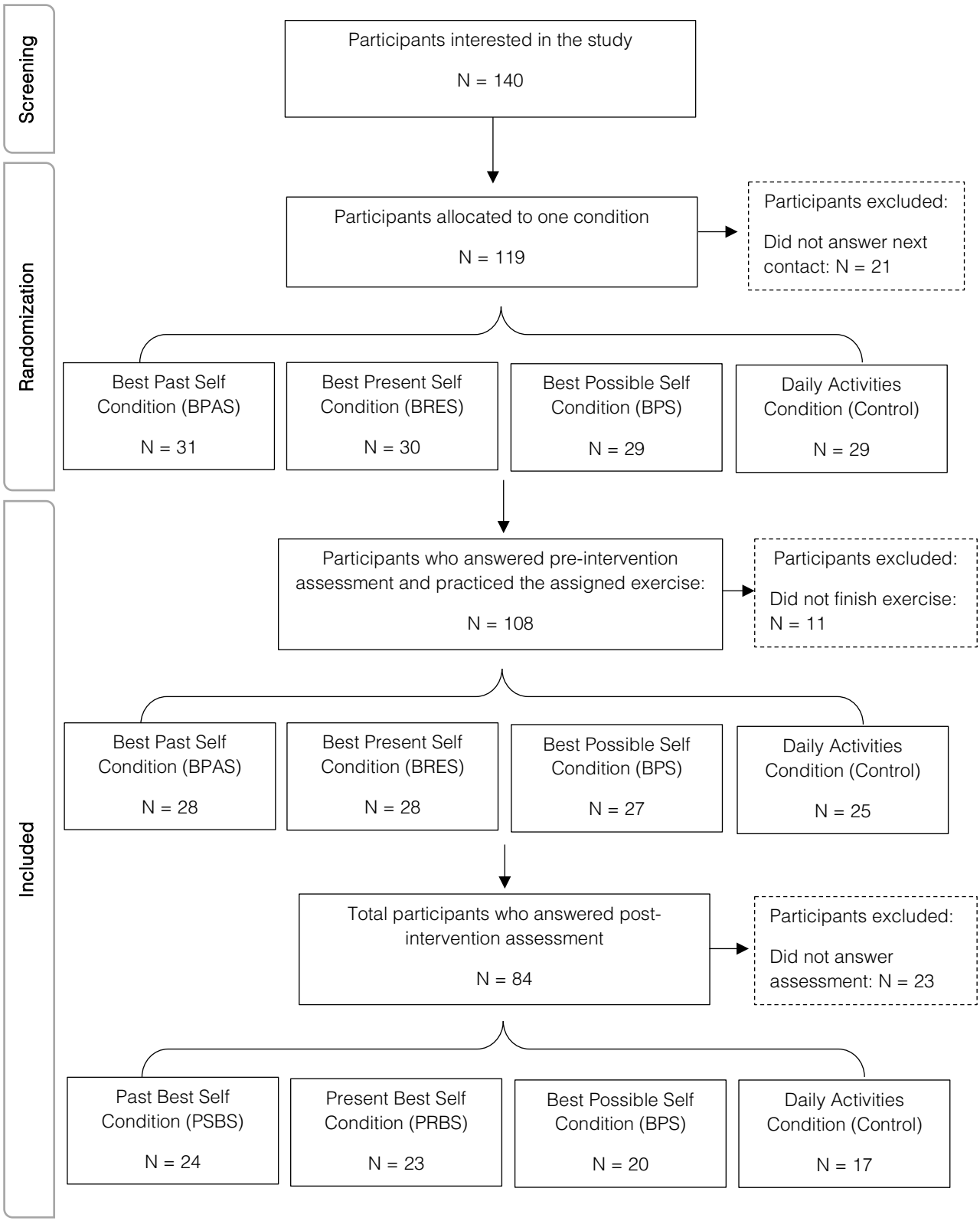
3.1.1. Participants

Participants were recruited through advertisements in social media and the research group webpage. They did not receive any compensation by participation, but they received a list of "10 evidence-based tips to increase wellbeing" upon completion of the study. As this study was intended to be a replication of Study 1 in a general population, the only exclusion criterion was to be younger than 18 years old.

The same rationale as in Study 1 was used for the sample size calculation and randomization process. In this case, randomization was done after participants informed their willingness to join the study.

Originally, 140 participants were interested in the study, and after the first contact by e-mail, 119 participants informed their willingness to participate. They were randomized to one of the four conditions and received a link with the online pre-intervention assessment and the instructions for the assigned exercise. The initial sample (participants who answered the pre-intervention assessment and completed the first day of exercise) was composed by 108 participants (89 women) aged from 18 to 48 years old (M = 23.86, SD = 6.25). Participants were randomized to BPAS (N = 28), BPRES (N = 28), BPS (N = 27) and control (N = 25). After one week, 84 participants (71 women), between 18 and 46 years old (M = 23.29, SD = 5.15) answered the post-intervention assessment. Analyses were carried out with 108 participants after carrying out intention-to-treat analyses. For more information, see Figure 2.

Figure 2. Flow of participants in Study 2



3.1.2. Interventions

Participants received the same instructions as in Study 1 adapted to an online format. The instructions of the assigned exercise appeared right after the pre-intervention assessment was completed, and participants could leave the webpage in any moment if they were no longer interested in participating. Then, they were encouraged to practice the assigned exercise for 7 days. After this period of time, participants received an e-mail with a link of the post-intervention assessment.

3.1.3. Technologies

In this study, all components of the intervention (contact with researcher, assessment, instructions, etcetera) were applied in an online format. In order to facilitate the engagement of participants to the intervention, the instructions of the exercises were simplified, adapted to an online format and delivered with multimedia content (videos).

3.1.4. Measures

In order to increase participants' recruitment, measures were also adapted to a self-applied online intervention. Laboratory sessions in a University context permit to use large battery scales for the assessment. However, Internet users are normally willing to participate in studies only if they are not highly time-consuming and they can find burdensome to answer long packs of questionnaires. For this reason, a Visual Analogue Scale (VAS) was used to assess positive and negative affect, and single-item measures were used to assess the remaining constructs of interest. All these items were selected from well-validated and psychometrically good measures and were intended to represent the essence of the construct. Although single-item and VAS measurement has some weaknesses, it has shown to be a valid way to assess

psychological constructs with adequate psychometric properties (e.g. Davey, Barratt, Butow, & Deeks, 2007; Hallford & Mellor, 2016; Williams, Morlock, & Feltner, 2010).

Primary outcome:

Positive and negative affect. Two visual-analog scales were used to assess affect. In the case of positive affect, it was composed of the following emotions: "happy", "proud", "optimistic" and "grateful". For negative affect, the included emotions were "sad", "ashamed", "pessimistic" and "angry".

Secondary outcomes:

Temporal satisfaction with life. Three items from the Spanish version of the TSWLS (Carrillo et al., 2018; Pavot et al., 1998) were used to assess past LS ("I am satisfied with my life in the past"), present LS ("I am satisfied with my life in the present"), and future LS ("I will be satisfied with my life in the future").

Self-efficacy. The item "I am confident that I could deal efficiently with unexpected events" from the Spanish version of the General Self-Efficacy Scale (Herrero et al., 2014; Schwarzer & Jerusalem, 1995) was included to measure self-efficacy.

Optimism. Optimism was assessed through the item "Overall, I expect more good things to happen to me than bad" from the Spanish version of the LOT-R (Otero et al., 1998; Scheier et al., 1994).

3.1.5. Procedure

All interventions were equal than the ones on Study 1. In this case, they were delivered totally in an online format. Participants signed the informed consent and answered the pre-intervention assessment, and then, they watched a video

with the instructions of the assigned exercise. They were encouraged to practice the exercise for a week, and after 7 days, they received a link with the post-intervention assessment.

3.1.6. Data analysis

Statistical analyses were conducted using the SPSS for Windows (v. 24). Following the same procedure as in Study 1, one-way repeated measures ANOVAS were performed for each measure in order to assess pre-post intervention changes in the outcome measures between conditions, and effect sizes (Cohen's *d*) and confidence intervals were calculated for within-group changes.

3.2. Results

3.2.1. Preliminary analyses

T-tests, ANOVAs and chi-square analyses on pre-intervention measures between conditions revealed no significant differences between conditions on any measure, indicating that randomization was successful (all *p* values > 0.05). Independent-sample t-tests on baseline scores between completers and dropouts showed no significant differences in any of the measures at baseline (all *p* values > 0.05). Intention-to-treat analyses were carried out, and pre-intervention scores of the dropout participants were imputed at post-intervention, so all analyses included 108 participants.

3.2.2. Main analyses

Mean, standard deviations and within-group effect sizes (measured by Cohen's *d*) can be found in Table 2.

Positive affect. There was a main effect of time on positive affect $F(1,104)$ = 11.01, $p < .001$, $\eta_p^2 = 0.10$. The interaction between time and condition was not significant $F(3,104) = 0.56$, $p = .644$. BPAS and BPRES showed significant within-group effect sizes.

Negative affect. Similarly, a main effect of time on negative affect was found $F(1,104) = 4.48$, $p = .037$, $\eta_p^2 = 0.04$, and no significant interaction between time and condition was observed $F(3,104) = 0.66$, $p = .578$.

Life satisfaction. There was a main effect of time on past LS $F(1,104) = 18.36$, $p < .001$, $\eta_p^2 = 0.15$, and the interaction between time and condition was marginally significant $F(3,104) = 2.49$, $p = .065$, $\eta_p^2 = 0.07$. Post-hoc analyses using Bonferroni correction revealed that participants in BPAS condition significantly increased their scores on past LS ($p < .001$), and BPRES ($p = .012$). In addition, BPAS and BPRES showed significant within-group effect sizes. Regarding present LS, neither the main effect of time nor the interaction between time and condition were significant ($F(1,104) = 2.79$, $p = .098$ and $F(3,104) = 0.83$, $p = .748$, respectively), and a significant within-group effect size emerged in the control condition. For future LS, there was a main effect of time $F(1,104) = 9.20$, $p = .003$, $\eta_p^2 = 0.08$, and the interaction between time and condition was marginally significant, $F(3,104) = 2.42$, $p = .07$, $p = .070$, $\eta_p^2 = 0.07$. Post-hoc comparisons showed that participants in BPRES condition significantly increased their scores on future LS ($p = .001$), and BPS ($p = .019$). In addition, BPRES and BPS showed significant within-group effect sizes.

Self-efficacy. There was a main effect of time on self-efficacy $F(1,104) = 9.85$, $p = .002$, $\eta_p^2 = 0.09$, and the interaction between time and condition was not significant $F(3,104) = 1.17$, $p = .325$. In this case, a significant within-group effect size emerged in BPS condition.

Optimism. No significant results were found for the main effect of time on optimism $F(1,104) = 3.00$, $p = 0.086$, $\eta_p^2 = 0.03$, neither on the interaction between time and condition $F(3,104) = 0.42$, $p = .742$.

3.3. Discussion Study 2

This study partially replicated the results obtained in Study 1, as all conditions significantly improved their scores of positive affect, self-efficacy and LS (past, present, and future), and significantly decreased their levels of negative affect without regard to condition. No significant effects were found for optimism. Attending to within-group effect sizes, the experimental conditions showed several significant results, whereas the control condition showed a significant effect size on present LS. Regarding experimental conditions, BPAS showed significant effect sizes on positive mood and past LS; BPRES showed significant effect sizes on positive mood and past and future LS; and BPS on self-efficacy and future LS. According to Cohen (1988), all significant effect sizes were moderate to large.

Results obtained in this study, similarly to Study 1, partially confirmed the aforementioned hypotheses: all experimental conditions were able to produce benefits on wellbeing, although no statistically significant differences were found between the control and the experimental groups.

In addition, this study (given the similar results obtained in Study 1) evidenced that it is possible to apply these interventions in a completely online format, with the consequent advantages in cost-effectiveness.

Table 2. Means (M) and standard deviations (SD) and within-group effect sizes of participants in Study 2

Measure	Condition	N	M (SD) Pre	M (SD) Post	Within-group effect size, d [95% CI] Pre-post intervention
Positive affect	BPAS	28	19.14 (4.54)	21.18 (4.10)	**0.49 [0.09, 0.89]**
	BPRES	28	20.96 (4.21)	22.25 (4.01)	**0.40 [0.01, 0.79]**
	BPS	27	19.67 (5.20)	20.52 (5.46)	0.19 [-0.20, 0.58]
	Control	25	20.56 (4.62)	21.40 (4.84)	0.24 [-0.17, 0.64]
Negative affect	BPAS	28	8.43 (4.18)	8.04 (4.23)	-0.12 [-0.50, 0.26]
	BPRES	28	8.46 (5.22)	6.89 (4.23)	-0.35 [-0.74, 0.04]
	BPS	27	9.33 (4.42)	8.37 (4.16)	-0.21 [-0.61, 0.17]
	Control	25	8.64 (3.97)	8.40 (4.57)	-0.08 [-0.49, 0.32]
Past Life Satisfaction	BPAS	28	5.04 (1.26)	5.82 (1.02)	**0.62 [0.22, 1.04]**
	BPRES	28	4.96 (1.37)	5.43 (1.07)	**0.45 [0.06, 0.85]**
	BPS	27	5.52 (1.12)	5.70 (1.07)	0.24 [-0.15, 0.63]
	Control	25	5.44 (1.33)	5.60 (1.26)	0.26 [-0.15, 0.67]
Present Life Satisfaction	BPAS	28	5.18 (1.31)	5.36 (1.13)	0.16 [-0.21, 0.55]
	BPRES	28	5.82 (1.06)	6.00 (0.82)	0.19 [-0.19, 0.57]
	BPS	27	5.41 (1.28)	5.33 (1.54)	-0.06 [-0.45, 0.32]
	Control	25	5.32 (1.28)	5.68 (1.18)	**0.48 [0.06, 0.90]**
Future Life Satisfaction	BPAS	28	5.68 (1.06)	5.75 (1.11)	0.07 [-0.30, 0.45]
	BPRES	28	5.61 (1.03)	6.00 (0.86)	**0.47 [0.08, 0.88]**
	BPS	27	5.33 (1.33)	5.89 (1.22)	**0.57 [0.16, 0.99]**
	Control	25	5.84 (1.03)	5.84 (1.03)	0.00

Table 2. Means (M) and standard deviations (SD) and within-group effect sizes of participants in Study 2 (continued)

Measure	Condition	N	M (SD)	M (SD)	Within-group effect size, d [95% CI]
			Pre	Post	Pre-post intervention
Self-efficacy	BPAS	28	5.46 (1.23)	5.61 (1.29)	0.15 [-0.23, 0.53]
	BPRES	28	5.75 (0.70)	5.86 (0.76)	0.15 [-0.23, 0.53]
	BPS	27	5.44 (1.28)	5.96 (0.98)	**0.55 [0.15, 0.97]**
	Control	25	5.36 (1.50)	5.72 (1.34)	0.33 [-0.07, 0.75]
Optimism	BPAS	28	5.64 (0.95)	5.64 (1.13)	0.00
	BPRES	28	5.93 (1.22)	6.07 (0.86)	0.14 [-0.24, 0.52]
	BPS	27	5.59 (1.12)	5.85 (0.95)	0.24 [-0.15, 0.63]
	Control	25	5.92 (1.19)	6.12 (1.13)	0.31 [-0.10, 0.72]

4. General discussion

This work aimed at examining the efficacy of the BPS and two temporal variants (one's best past self and one's best present self) over a control condition on wellbeing outcomes. As far as we know, this is the first attempt to study the role of the temporal factor of the BPS intervention. Two RCT with the same design were included in this work, the first one with a blended approach applied to University students, and the second one applied in the general population and completely delivered online.

Both studies partially confirmed the hypotheses of this work. On the one hand, as expected, writing about one's past, present and future best selves produced wellbeing increases. The slight divergences in the results found between both studies may be due to the different methods of implementation and the included scales. First, online participants (Study 2) did not have any contact with researchers neither received any compensation for participation. It has been stated that self-applied positive activities may produce lower benefits than traditional face-to-face PPIs (Bolier et al., 2013; Sin & Lyubomirsky, 2009). Although this latter approach may be more comfortable for participants, their involvement in the practice might have been lower compared with participants in Study 1. In order to address this issue, it could be highly informative to assess the amount of practice carried out by participants (e.g. to register the number of times that participants entered into the webpage to practice) as a measure of participants' involvement in future studies. In addition, measures were different among studies due to the adaptation to an online format, which required to shorten the assessment process.

On the other hand, except for self-satisfaction in which BPRES and BPS showed significant increases, no significant differences were found between the experimental conditions and the control group. Contrary as it was expected, all interventions including the control condition were able to increase wellbeing. These results worth to expound. The exercise used for the control condition (daily activities recall) has been typically used in BPS studies (see Carrillo,

Rubio-Aparicio, et al., 2018 for a review). Although BPS has demonstrated wellbeing increases compared to controls, not all studies have found significant differences among conditions, being both groups beneficial for wellbeing (e.g. King, 2001). Control conditions have also shown positive results on wellbeing variables in other PPIs studies (e.g. Mongrain & Anselmo-Matthews, 2012; Seligman, Steen, Park, & Peterson, 2005; Woodworth, O'Brien-Malone, Diamond, & Schüz, 2017). In this work, some factors might explain these results.

First, even that the sample size was previously calculated, the lack of statistically significant differences in addition to the different results in the significant within-group effect sizes could reflect insufficient statistical power for the included measures. Statistically significant results with *p*-values are directly dependent of sample sizes, whereas effect sizes are a measure of the strength of a phenomenon and do not directly dependent on the sample sizes (Gerber & Malhotra, 2008; Kühberger, Fritz, & Scherndl, 2014). Future studies could confirm if statistical differences can be found with larger samples.

Second, the effectiveness of PPIs seems to partially respond to the demand effects of participating in any intervention (Wood & Tarrier, 2010). These volunteer individuals (also called "happiness seekers") are actively seeking to increase their levels of wellbeing and are aware of the positive outcomes they may experience by practicing these exercises, independently of the assigned condition (Parks, Della Porta, Pierce, Zilca, & Lyubomirsky, 2012). As stated for psychotherapy, clients are "anything but passive recipients of therapeutic wisdom": they actively work towards and make use of their creativity to pursue their purposes of improving in therapy (Bohart & Tallman, 2010, p. 89; Bohart, 2000). Similar processes may take place with participants interested in partaking in a PPI. In addition, it has been proposed that the benefits obtained in some placebo groups might respond to the activation of positive and self-relevant information, also present in the experimental conditions (Mongrain & Anselmo-Matthews, 2012). The active seek for a happiness enhancement could have led participants to activate this positive self-relevant information by engaging in

processes that typically belong to some types of PPIs. For example, some participants might have had actively engaged in a savoring exercise when they recalled their activities of the last 24 hours. Savoring is the process in which one appreciates a positive stimulus in the current moment, in the past (by recalling) or the future (anticipating) (Bryant & Veroff, 2007). Being aware that the assigned exercise was (supposedly) designed to bolster their wellbeing levels might have triggered a conscious attention and willingness to relive the positive events that took place during the day in order to increase their positive affect. Furthermore, there is a chance that some participants had gained awareness about all things they managed to carry out during the day, with its consequent increase in positive affect and feelings of self-efficacy (Schutte, 2014). Even a gratitude reflection could have been performed by some participants by appreciating all the little things that happen in their ordinary days from which one can be grateful for (Davis et al., 2016). All these processes, in addition to the potential lack of statistical power in the analyses, might have contributed to the obtained results in this work.

Replication is the core of the scientific advancement, also in the Positive Psychology field. The positive results obtained in control conditions in this work and other mentioned studies are another reason why it is necessary to further explore the working mechanisms of PPIs, in order to investigate the possible differences among them and between them and control conditions. Future research could include, for example, qualitative analyses of the written texts, or open-ended questions in the assessment protocols that ask about what participants concretely did in order to perform the assigned exercise. More research in this area will also help to clarify what are the processes that underlie some control conditions and why they display positive outcomes similar to experimental conditions in some studies.

This work has some limitations that are necessary to address. Regarding the sample, Study 1 was based primarily on University students. This limitation was partially solved in Study 2, as it was applied in the general population.

Nevertheless, participants of both studies are mainly young (M = 21.76 and M = 23.86, respectively). Since there is evidence about the differences between age ranges in constructs related to SWB (Carrillo et al., 2018), future studies with broader age groups would shed light on the role of age in these results. Regarding the instruments, the scales used in both studies are not completely equivalent: although the same constructs were measured in both studies, Study 2 relied on single-items measures from larger scales instead of complete questionnaires. In addition, some measures included (e.g., optimism) are trait-like measures or assess broad constructs, which reduces the likelihood to detect variability in short PPIs as the ones used in this study (Pietrowsky & Mikutta, 2012). It is possible that including measures more sensitive to change would have allowed to find more differences among conditions. It is also worth to consider that follow-up analyses were not included, which do not permit explore if these results were maintained in the long term. Finally, the effects of the ICTs used in Study 1 were not compared to conditions without technologies, as it would have resulted in a total of 10 conditions (8 experimental conditions and 2 control conditions), which was not possible to address in this work. However, comparison between both RCTs contained in this work permits us to observe that it is feasible to migrate the interventions from a traditional format (Study 1) to an online format (Study 2) with similar results.

In light of the results obtained in this work, it seems that writing and visualizing about one's best past, present and future self are useful interventions to improve wellbeing. In addition, within-group effect sizes imply that these interventions may be more effective than the control condition. The temporal manipulation of the BPS suggests that the BPS intervention can be effective without regard of the temporal focus, and it may be sufficient to promote a positive outlook about oneself in any temporal frame. Taking these results into consideration, it is possible that combining all variants in a more comprehensive intervention would produce more intense effects on wellbeing increases, and that developing each variant would help to construct the others. The broaden-and-build theory suggests that "positive emotions broaden people's momentary thought-action

repertoires, which serves to build their enduring personal resources" (Fredrickson, 2001, p. 1). In addition, self-efficacy seems to have a mediator role in this process (Schutte, 2014). Following this rationale, to promote a positive view about oneself in the past could contribute to picture one's best self in the current moment by promoting positive affect and broadening one's though repertoires, which in turn by would facilitate a positive approach to one's current best features (thus, helping the construction of one's best present self). In the same line, to reflect on one's best past and current self could boost self-efficacy, which could help participants to envision themselves positively and optimistically in the future and to feel capable to achieve their desired goals. All these interventions, in turn, could help to build a positive outlook about oneself along the whole lifespan, increasing one's personal resources in the long term. Further studies are needed to examine this hypothesis, in order to evaluate if a "whole best self" intervention (including all temporal frames) is an effective intervention to bolster wellbeing and if their effects are larger than the ones produced by only one temporal frame.

In conclusion, this work contributed to a better understanding of the ins and outs of one of the most commonly used PPIs. Research on these questions is still in its infancy, hence it is vital to continue investigating about the mechanisms of action of each PPI, as professionals need to know which the best interventions for their target population are and why they might be beneficial for them. For this reason, we encourage researchers to persist in this endeavor.

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Annex 1. Transcription of the audio instructions of the experimental conditions

BPAS condition:

We would like you to visualize in your mind, with as much detail as possible, your best past self. In order to do this, focus on your past and visualize yourself in the best time or moment where you consider that the best version of yourself appeared (…).

BPRES condition:

We would like you to visualize in your mind, with as much detail as possible, your best current self. To do this, focus on your present, and visualize yourself currently. Identify those abilities, qualities or characteristics of yourself that you currently consider the most relevant and that represent the best version of yourself (…).

BPS condition:

We would like you to visualize in your mind, with as much detail as possible, your best possible self. Focus on your future, and imagine yourself and the qualities, skills, achievements, etc., that would form the best version of yourself and the best way in which your life could develop. Imagine that everything has gone in the way you wanted (…).

All experimental conditions:

(…) Take some time to imagine it. You can guide the construction of your best past/present/future self taking into account the following three areas: personal area (for example, feelings, physical abilities, personal achievements...), academic or professional area (professional achievements, goals...), social area (friendships, family relationships…). To build your best past/present/possible self use as much sensory information as possible: smells, tastes, sights, sounds, feelings… It will probably help you if you close your eyes and focus on what you visualize in your mind.

Annex 2. Transcription of the audio instructions of the control condition

We would like you to visualize in your mind, with as much detail as possible, the activities you have done today. To do this, focus on the activities of your daily life that normally go unnoticed, such as meetings, classes, conversations, etc. This exercise consists of remembering them and visualizing them in your mind as vividly as possible. To help you determine and guide what to focus on, think about an agenda of the last 24 hours and review it slowly. Think about each activity you have done, when and where it took place and with whom. It will probably help you if you close your eyes and focus on what you visualize in your mind.

Annex 3. Transcription of the audio instructions of the lemon visualization exercise

Close your eyes and focus on the experience. Imagine that you are in a garden full of trees on a sunny day. Relax and breathe the fresh air. Feel that fresh air on your face and your body, feel the sun on your skin. Imagine that among those trees you can see a lemon tree. Imagine that there is also a table with a plate and a knife. Look through your own eyes as you walk towards the lemon tree. Grab the most appetizing lemon on the tree. Look closely at this magnificent yellow and juicy lemon. Feel its soft texture with your fingers. Bring it closer to your nose and start to distinguish the different nuances of lemon aroma. Next, go walking towards the table, observe well how you take the knife and make two cuts in the lemon: one, two, dividing it into four pieces. Take one of the pieces and take it to your nose. At that moment you realize the new aromas that emanate from the lemon: more intense. You notice a sense of freshness and cleanliness. Now, bring the lemon to your mouth, bite it and notice the acid taste of the lemon in your mouth. Keep savoring the experience.

5

Qualitative analysis of the Best Possible Self intervention: underlying mechanisms that influence its efficacy.

This chapter is currently under review as: Carrillo, A., Martínez-Sanchis, M., Etchemendy, E., Baños, R. M. Qualitative analysis of the Best Possible Self intervention: underlying mechanisms that influence its efficacy.

Abstract

The Best Possible Self (BPS) is a Positive Psychology Intervention (PPI) which asks participants to write down about themselves in their best possible future. Previous studies have shown its efficacy to enhance wellbeing. However, the mechanisms that underlie its efficacy are still unknown. Participants (N = 79) were randomized to either BPS condition, or one of two variants of the intervention (one's best self in the present and one's best self in the past). Qualitative analyses of the texts were carried out to explore the main themes and features of the essays. Then, a mixed-methods approach with quantitative and qualitative data was followed, in order to analyze the relationship between the content of the texts and the change in positive affect produced by the PPIs. Significant differences between conditions were found in the content of the compositions. Regression analyses showed that different variables predicted the change in positive affect depending on the condition. Mediation analyses also found differences among conditions. These findings suggest that these interventions respond to different underlying mechanisms which influence their efficacy. This study contributed to a better understanding of why PPIs work, and how to increment their efficacy.

1. Introduction

Historically, individuals have made profuse efforts to achieve the road of happiness and wellbeing. Lately, these efforts have crystallized in the Positive Psychology research movement, whose aim is to provide an evidence-based framework for the study of what makes people happy and how to bolster their wellbeing levels (Seligman & Csikszentmihalyi, 2000). Although there is a lack of a unified definition of wellbeing, one of the main historical approaches proposes wellbeing as the balance between positive and negative emotions and a high sense of satisfaction with life, also known as subjective wellbeing (SWB) (Diener, 1984). Positive Psychology Interventions (PPIs) emerged precisely as a response to the societal need of increasing people's overall wellbeing levels, including SWB. This applied portion of Positive Psychology consists of activities aimed at increasing positive emotions, cognitions or behaviors (Mitchell, Vella-Brodrick, & Klein, 2010; Sin & Lyubomirsky, 2009). Research on the efficacy of these interventions has burgeoned since its beginning, and nowadays there are multiple published studies about new and heterogeneous exercises that can help people flourish. Indeed, several meta-analyses have shown that PPIs are effective approaches to increase wellbeing with small to moderate effect sizes (Bolier et al., 2013; Sin & Lyubomirsky, 2009).

One of the most widely used PPIs is the Best Possible Self (BPS) intervention, in which participants are asked to write down about their best possible self in a future where they have achieved everything desired, after working hard towards it. This intervention was developed initially by King (2001), and it was based on the trauma writing paradigm, which had found that writing sessions about upsetting and negative topics as a traumatic event produced both physical and mental health improvements (Frattaroli, 2006; Pennebaker & Seagal, 1999). As a response to the emerging interest on the positive side of life (Seligman & Csikszentmihalyi, 2000), this research migrated to the interest on the effects of the positive writing paradigm (i.e., writing about positive topics), being the BPS intervention one of its main examples. Based on the writing paradigm of Pennebaker, King (2001) developed this intervention and compared it with a

writing disclosive exercise about a traumatic event. Results showed that BPS intervention produced the same benefits as trauma-focused writing on health. BPS, in addition, produced significant increases in positive mood and wellbeing, and participants in this condition rated the exercise as less upsetting than the trauma condition participants. These results go in line with the last meta-analysis about disclosive writing, which found no significant differences between interventions focused on disclosing negative events and the ones focused on disclosing positive events on psychological and health benefits (Frattaroli, 2006). As Frattaroli stated, since trauma writing paradigms usually produce temporary increases in negative affect, choosing the disclosure of positive events may be preferable, as it avoids this short-term negative side effects and it has shown the same positive results.

Since the first approach by King, many studies have been carried out in order to test the efficacy of this PPI. A recent meta-analysis about 28 studies showed that BPS is an efficacious intervention to improve wellbeing and found moderate effect sizes of BPS over control groups on positive affect (d = .339 and d = .657) (Carrillo, Rubio-Aparicio, et al., 2018). However, analyses of moderators (i.e., length, dosage, delivery method, etcetera) did not show significant results in this review. Therefore, the characteristics of the BPS intervention that might influence its efficacy could not be identified. This is one of the main questions around the field of PPIs: to explain where the efficacy of the PPIs lies. Some authors have attempted to explain why and under which circumstances PPIs work, developing some theoretical models that can be applied to all PPIs in general (e.g. Lyubomirsky & Layous, 2013; Quoidbach, Mikolajczak, & Gross, 2015). However, this field is considerably recent, and these models still need to be validated (Wang et al., 2017). In addition, they are applied to the complete range of PPIs despite their heterogeneity, hence there is a lack of knowledge about the circumstances that make each intervention individually effective. Indeed, still little is known about why and how these interventions work, and further research is needed (Bolier et al., 2013; Lyubomirsky & Layous, 2013), which is also the case of the BPS intervention.

One of the approaches that can shed light on the possible mechanisms that underlie the efficacy of a writing intervention is a qualitative analysis of its content. In fact, the benefits of positive writing have derived to an increasing interest on the qualitative variables of the writing tasks, although research is still scarce. In the case of the BPS intervention, only a handful of studies explored the content that participants wrote about. King (2001) found that the BPS essays included a variety of topics, such as job success, self-improvement, marriage and family, travel, or home ownership, although no further analyses were carried out on the frequency of these topics. Hill and colleagues (2015) analyzed the texts of the BPS compositions in order to classify the goals included in the essays and found fourteen categories. The most frequent goals were *approach* (those with references to approaching something positive), *intrapersonal* (goals that mentioned only the self), and *achievement* (those goals related to accomplishing a goal or achieving success). Correlation analyses were carried out to explore the association between written goals and measures of life satisfaction and religiosity. Results showed that life satisfaction was negatively correlated with *spirituality* goals (related to a higher power and/or to unity and justice). In addition, Loveday et al. (2017) carried out a thematic analysis of the BPS texts specifically focused on spare time using an explicit conceptual framework on leisure (Newman, Tay, & Diener, 2014). Results showed that within the leisure area, *affiliation* (leisure spent with other people), *autonomy* (leisure spent on oneself) and *detachment-recovery* (leisure mentioned in relation to work) were the most frequent themes (33, 23, and 21 percentage of leisure sentences, respectively). However, this study only addressed the content of the essays within the previously mentioned framework focused on spare time and only analyzed the sentences coded as *leisure*, which represented 41% of the content, whereas the remaining 59% of the sentences categorized as non-leisure were not explored. As it can be seen, these first approaches have explored the qualitative characteristics of the texts of the BPS essays, but they were carried out within specific frames that might have constrained their results. Hence, there is still a scarce knowledge about which content, in general, participants include

in their essays when they write about their BPS, and a broader approach could contribute to a better understanding about this subject. In addition, none of these studies have combined the content analyses with quantitative data about the efficacy of the intervention, thus the role that the content of the texts may play on its efficacy is still unknown.

Therefore, the main objective of this work is to shed light on the content of the BPS intervention and its relationship with its efficacy. For this purpose, qualitative analyses about the BPS intervention and two temporal variations of this PPI already tested in a previous study will be carried out. These variants are one's best self in the present (BPRES) and one's best past self (BPAS). A previous Randomized Controlled Trial showed that these three PPIs (BPAS, BPRES, and BPS) were equally effective over wellbeing outcomes (e.g., positive affect) with no significant differences among conditions (Carrillo, Etchemendy, & Baños, 2018). However, it is unknown what underlying mechanisms influence the efficacy of these positive writing PPIs, and whether the same mechanisms have an equal influence on the three conditions.

Specifically, this work has two aims. On the one hand, to analyze the content of the texts in order to identify the main themes and features of the compositions of the three PPIs (BPAS, BPRES, BPS) and to explore the possible differences between conditions. On the other hand, to examine the influence that the identified themes and features of the texts have on the efficacy of the interventions on positive affect. This is the first approach that analyzes the content of the texts of the BPS intervention with a broad approach and combines it with the quantitative data about its efficacy. Thus, due to the exploratory nature of the analyses, no specific hypotheses were generated for both the content and the role that it may play in the efficacy of the intervention.

2. Method

2.1. Participants

The sample consisted of 81 participants who were also part of a larger study (see Carrillo et al., 2018). Their age ranged from 18 to 40 years old (M = 20.23, SD = 4.10), and 77.2% of them were women. They were randomized to one of three conditions: BPAS (N = 27), BPRES (N = 27), BPS (N = 27). Text analyses showed that two participants did not follow the instructions of the assigned conditions and, consequently, they were eliminated of the study. The final sample consisted of 79 participants (BPAS = 27, BPRES = 26, BPS = 26).

2.2. Interventions and procedure

This study included three PPI, based on the original BPS exercise. The BPS condition asks participants to visualize themselves in the future after everything has gone as well as possible (Sheldon & Lyubomirsky 2006; Meevissen, Peters & Alberts 2011). Based on this intervention, two variants of the exercise were designed with the same format and instructions, except for the time frame in which they were focused on. Concretely, the Best Past Self condition (BPAS) required to recall a time in the past when participants considered they had displayed the best version of themselves, whereas the Best Present Self condition (BPRES) asked participants to think about the best version they offered to the world at the present time. All conditions encouraged participants to include as many sensorial details as possible, as the procedure included an explicit visualization component in which they spent 5 minutes visualizing about their best self after writing about it (Holmes, Coughtrey & Connor 2008; Meevissen, Peters & Alberts 2011).

All participants received the same message: they would learn an exercise that could improve their wellbeing. The intervention lasted 7 days. Participants came to the laboratory for the first session, in which they learned the assigned exercise after signing the informed consent. They had to spend 15 minutes writing their

essay, and then 5 minutes mentally visualizing the content. During the remaining 6 days, they had to mentally visualize the content of the essay written on the first day. After 7 days, participants received a link with the post-intervention assessment. This work was registered in the United States National Institute of Health Registration System (http://www.clinicaltrials.gov) with Clinical Trials Registration Number NCT03024853 and approved by the ethical committee of the University of Valencia (H1415802387094).

2.3. Coding of the essays

Essays were analyzed to explore two main areas. On the one hand, the content of the essays (it is, what did participants write about when they reflected on their best past, present or future self). On the other hand, the features of the compositions or, in other words, how they expressed these ideas (for example, the number of words or its emotional valence).

The followed approach was based on the consensual qualitative research-modified (CQR-M), a qualitative research method designed to be applied in large samples (i.e., more than 15 participants) and relatively brief qualitative data, which can be used to describe little-studied phenomena and establish a basis for further research. This method is defined as a bottom-up approach, through which categories are derived from the data instead of forcing a predetermined structure on it (Spangler, Liu, & Hill, 2012). With this method, as the authors state, a further comprehension of the topic under research can be obtained by combining the newly described phenomena with quantitative data.

In order to reach consensus, following the CQR-M guidelines, all team members discussed disagreements at each step of the process. The coding team was composed by the first and second authors (AC and MMS), who were experts on the interventions used in the study, knew the instructions and procedure and had previously conducted studies with the included activities. The next procedure was followed: first, two independent coders (AC and MMS) read all

the essays independently and generated a list of themes and areas identified in the texts. Secondly, these themes were discussed by the researchers, and then the revised themes were applied in the analyses of 30 randomized essays, in order to explore whether these were adequate and captured all the relevant ideas. After a revision of the themes, all essays were analyzed independently by the two coders in order to categorize all the contained bins of information with the designated themes and the subsequent areas. Interrater reliability and frequency of themes were calculated (see Method and Results sections).

These themes were not mutually exclusive. In addition, since this analysis relied on bins of information, they did not necessarily coincide with a complete sentence: it was possible that a single sentence contained two ideas (for example, "the social area is very important in my life: I like to communicate with people and I tend to be quite open and affectionate", would be coded as *friendship* and *positive features*), and it was also possible that the same idea expressed in two or more sentences would be coded as one unit (for example, the two sentences "I want to expose myself to what life brings to me. I want to feel inexperienced to able to improve" would be categorized as *positive features).*

Themes of the texts:

The final categories included could be grouped into four areas: personal, academic/professional, social, and leisure area. Regarding personal area, *positive features* collected all phrases that expressed a personal improvement on one's trait or psychological ability, or an already present positive feature that remained constant (e.g., "In the future I would like to have the same psychological abilities that I currently have"); *skills* referred to the presence or the willingness to learn an ability or knowledge (e.g., "I would like to learn how to play the piano or the harp"); and *health* was coded when participants talked about their attempts to influence their physical health (e.g., "My best self figured out my intestinal problem and now she's thin and strong"). Concerning the academic or professional area, themes were divided by the inner motives

expressed in the texts, being *intrinsic* the content related with the academic or professional area associated with intrinsic motives (e.g., “Now I have a job in which I feel very happy, and I have realized that I love my job”), and *extrinsic* when extrinsic motives were expressed (e.g., “I visualize myself wearing a suit and having quite a lot of money”). With respect to the social area, *friendship* was coded on phrases containing social relationships with friends or colleagues (e.g., “I felt very close to my childhood friends because we were all going through the same phase”), *family* on mentions to relationships with members of the family (e.g., “When I get home, I tell my family about my day and I hear about theirs”), *partner* in the case of romantic relationships (e.g., “I had a partner with whom I enjoyed our shared moments”), and *help* emerged when participants made an explicit reflection on their willingness to or their actions aimed at helping other people in different contexts (e.g., “I decided I would watch over the happiness of others, trying to improve their lives”). Lastly, the leisure area only included the *leisure* theme, which contained phrases related to how their best selves spent their free time or practiced different hobbies (e.g., “I had time to watch TV series and movies”).

Features of the texts:

In addition, the collected features of the compositions were: length of the essay (total number of words), quantity of sensorial details (e.g., “I was drinking tea, it tasted stronger than usual. I added sugar and started to blow, it was so hot... I could see the steam coming out of the cup”), emotional valence of the essay, and incongruousness. Emotional valence was calculated as the subtraction of the total number of positive emotional states (e.g., “It was some years ago, but the feeling still lingers: pride”, “I feel vigorous, energetic, tolerant and strong”) minus the number of negative emotional states (e.g., “In my future I keep seeing a lot of stress and anxiety”, “I feel pretty demotivated in my academic life”) in each text. Regarding incongruousness, it was coded on phrases in which participants talked about a positive feature explicitly expressed as no longer present (e.g., “I have the feeling that I enjoyed the little things more than I do

now"), or the willingness to reduce or eliminate the presence of a personal feature (e.g., "My best self would learn not to overthink everything, because right now I brood a lot about everything").

Finally, all essays were coded independently by two researchers (AC and MMS). Disagreements were resolved by consensus and by consultation with a third researcher expert in the field (RMB). Intercoder reliability was assessed with Kappa coefficients and correlations between coders for all categories. Kappa values ranged from .78 to 1, and correlations ranged from .87 to 1 (see Table 1). These results indicate high levels of agreement (Cohen 1988).

2.4. Scales

A mixed-methods approach using quantitative and qualitative methodologies was followed in order to explore the relationship between the content and features of the texts and positive affect.

The quantitative outcome measure included was positive affect, as it has been widely used in previous studies (Carrillo, Rubio-Aparicio, et al., 2018).

The scale used to measure positive affect (PA) was the subscale of PA of the Positive and Negative Affect Scale, PANAS (Watson, Clark, & Tellegen, 1988), which includes 10 positive emotions (e.g., inspired) to measure positive mood. Respondents rate how they usually feel on a 5-point Likert-type scale. In this study, a Spanish version was used (López-Gómez, Hervás, & Vázquez, 2015). Cronbach's alpha for the original scale ranged from .86 to .90, and in this sample alpha value was .90. Participants answered the scale the first day before practicing the assigned exercise (pre-intervention assessment), and 7 days after the intervention started (post-intervention assessment).

Table 1. Kappa values and intercoder correlations

	Kappa values	Correlation values
Themes of the texts		
Personal area		
Positive features	.81	.97
Skills	.78	.87
Health	.88	.90
Academic/professional area		
Intrinsic	.78	.89
Extrinsic	.91	.91
Social area		
Friendship	.78	.91
Family	.91	.90
Partner	.97	.92
Help	.85	.92
Leisure area		
Leisure	.85	.92
Essay features		
Positive emotional states	.90	.98
Negative emotional states	.80	.92
Incongruousness	.90	.98
Sensorial details	1	1

Notes: For all correlations, $p < .001$. Positive and negative emotional states were subsequently used to calculate the emotional valence of the texts.

2.5. Data analyses

Analyses of the texts were carried out with ATLAS.ti software for Windows (v. 7.5.4). Statistical analyses were conducted using the SPSS software for Windows (v. 24). In order to test the differences between conditions on the content and features of the texts, two multivariate analysis of variance (MANOVAs) were carried out, one for the content themes and another for the text features. To examine the content themes and text features that predicted the change in PA, a stepwise multiple regression analysis was conducted entering the change in

PA as dependent variable, and all themes and text features as independent variables. Change in PA was calculated using pre-intervention PA scores and post-intervention PA scores (i.e., change = post-intervention PA - pre-intervention PA), where positive values for change in PA reflected an improvement. Finally, ten parallel multiple mediation analyses (one for each theme) were performed in each condition to test whether the effect of the content of the text on change in PA was mediated by the form of the text, using the procedure described by Hayes (2013) from the PROCESS macro (version 2.16), choosing "model 4". In our proposed mediation models, we included the features of the texts as mediators in the relationship between the themes of the essays and the change in PA. That is, we explored whether the effects produced by the themes of the texts on the change in PA were mediated by how these texts were written. These analyses were carried out for each condition. Bias-corrected bootstrap 95% confidence intervals (CIs) based on 5,000 samples were used to assess the specific and total indirect effects. A CI that did not include the zero value indicated a significant indirect effect, implying that the effect of the theme on the change in PA was mediated by the features of the texts. Pairwise comparisons between specific indirect effects were carried out to test whether one indirect effect was statistically different from another through the confidence interval.

For both regression and mediation analyses, the frequency of participants who included each theme and feature in their text was calculated for each condition. This was done as some themes or features were especially uncommon in some conditions. Therefore, if a specific theme or feature appeared in less than 25% of the texts (that is, less than 7 participants of one condition included it in their texts), it was considered that the theme/feature was no representative of the sample on that specific condition, and thus it was not included in the analyses of that condition. For example, sensorial details were not included in the mediation analyses in BPS condition as it appeared in less than 25% of the texts in this condition.

3. Results

3.1. Descriptive analyses of the themes

Means and standard deviations of each theme and feature of the texts on the different conditions can be found in Table 2. Generally, the most frequent themes of the texts on the three conditions taken together were *positive features* (M = 2.13, SD = 1.57), *friendship* (M = 1.18, SD = 0.97), and *intrinsic* (M = 0.85, SD = 0.79), and the least frequent ones were *skills* (M = 0.20, SD = 0.56), *health* (M = 0.28, SD = 0.45), *partner* (M = 0.38, SD = 0.58) and *help* (M = 0.34, SD = 0.62). The mean valence of the essays taking all conditions was 1.69 (SD = 2.00).

3.2. Differences between conditions on the content of the texts

Table 2 shows the mean, standard deviations, and the MANOVA results for the effect of condition on the themes of the essays. The MANOVA revealed that, using Pillai's trace, there was a significant effect of condition on the presence of the different themes, $V = 0.72$, $F(20, 134) = 3.79$, $p < .001$, $\eta^2_p = .36$. According to Cohen's (1988) indications, the effect size was large ($\eta^2_p > .14$). Separate univariate ANOVAs revealed significant effects of condition on *positive features*, *skills*, *friendship*, *family* and *partner*. No significant effects of condition were found on *health*, *help*, *leisure* or on the academic/professional area, neither on *intrinsic* or *extrinsic* themes.

Regarding personal area, *positive features* was more frequent in BPRES than in BPAS and BPS, and *skills* appeared more frequently in BPRES than in BPAS. Regarding social area, *friendship* was more frequent in BPAS than in BPRES and BPS, *family* was more frequent in BPS than BPAS, and *partner* appeared more frequently in the texts in BPS than in BPRES.

3.3. Differences between conditions on the features of the texts

Table 3 shows the mean, standard deviations, and the MANOVA results for the effect of condition on the features of the essays. The MANOVA showed that, using Pillai's trace, there was a significant effect of condition on the presence of the features of the texts, $V = 0.22$, $F(8, 146) = 2.31$, $p = .023$, $\eta^2_p = .11$. According to Cohen's (1988) indications, the effect size was moderate ($\eta^2_p > .06$).

Separate univariate ANOVAs revealed that the number of sensorial details was higher in BPAS than in BPRES texts, and incongruousness appeared significantly more times in BPS than in BPRES. A tendency to reach significance on the effect of condition on the valence of the essays was found, being more positive in BPAS than in BPS. No significant differences between conditions were found on length.

3.4. Analyses of the predictors of the change in PA: do the themes and features of the texts predict the change in PA?

Three stepwise multiple regression analyses, one for each condition, were used to examine which themes and features predicted change in PA. Variance Inflation Factor ranged from 1.00 to 1.01, indicating no problems with multicollinearity (Bowerman & O'Connell 1990; Myers 2000). All the themes and features were entered simultaneously. For BPAS, only emotional valence remained as a significant predictor of change in PA ($\beta = 0.84$, $t = 2.84$, $p = .009$). The model was statistically significant, $F(1,25) = 8.05$, $p = .009$, $R^2 = .24$, $R^2_{\text{Adjusted}} = .21$, explaining 21% of the variance. By contrast, for BPS, length of the essay ($\beta = 0.02$, $t = 2.07$, $p = .050$) and *extrinsic* theme ($\beta = 3.71$, $t = 3.02$, $p = .006$) remained as significant predictors of change in PA. The model was statistically significant, $F(1,23) = 4.29$, $p = .050$, $R^2 = .39$, $R^2_{\text{Adjusted}} = .34$, explaining 34% of the variance. In the case of BPRES, none of the variables remained as significant predictors.

3.5. Parallel multiple mediation analyses: do the features of the texts mediate the relationship between the themes of the texts and the change in PA?

In BPAS condition, there were significant indirect effects of *friendship* and *partner* on change in PA through emotional valence, b = 0.76, 95% CI [0.22, 1.95] and b = 0.98, 95% CI [0.06, 3.29], respectively (see Figure 1), as bias-corrected bootstrap 95% confidence intervals (CI) for the indirect effects, based on 5.000 bootstrap samples, did not included zero. Neither the total effect, b = -0.97, t = -2.02, p = .056, nor the direct effect, b = -0.55, t = -1.02, p = 0.319 were significant. No significant indirect effects were found for the rest of the themes and features, as all CI included zero. Thus, results imply that, when participants in BPAS condition wrote about the themes *friendship* and *partner*, they wrote more positive texts (i.e. with higher emotional valence), and that produced higher changes in PA.

For BPS, there were significant indirect effects of *positive features* and *family* on change in PA through length (number of words), b = 1.20, 95% CI [0.13, 3.95], and b = 2.83, 95% CI [0.50, 7.64] respectively, given that bias-corrected bootstrap 95% confidence intervals (CI) for the indirect effects, based on 5.000 bootstrap samples, did not include zero (see Figure 2). Again, neither the total effect, b = 1.38, t = 1.52, p = 0.141, nor the direct effect, b = 0.63, t = 0.71, p = 0.488 were significant. No significant indirect effects were found for the rest of the themes and features, as all CI included zero. These results suggest that, when participants in BPS condition wrote about their *positive features* or *family*, they wrote longer texts (i.e. higher number of words), and that produced higher changes in PA.

Regarding BPRES, no significant indirect effects were found, as all CI included zero and all p > .05.

Table 2. Means (M) and standard deviations (SD) for the themes of the essays per condition

Themes	BPAS M (SD)	BPRES M (SD)	BPS M (SD)	TOTAL M (SD)	ANOVA results	Post-hoc comparisons
Personal area						
P. features	1.52 (1.42)	3.12 (1.75)	1.77 (0.99)	2.13 (1.57)	$F(2, 75) = 8.50$, $p < .001$, $\eta^2_p = .185$	BPRES > BPAS, $p = .001$; BPRES > BPS, $p = .006$
Skills	0.00 (0.00)	0.38 (0.70)	0.23 (0.65)	0.20 (0.56)	$F(2, 75) = 3.49$, $p = .036$, $\eta^2_p = .085$	BPRES > BPAS, $p = .027$
Health	0.19 (0.40)	0.23 (0.43)	0.42 (0.50)	0.28 (0.45)	$F(2, 75) = 2.04$, $p = .137$, $\eta^2_p = .052$	*n.s.*
Academic / professional area						
Intrinsic	0.85 (0.72)	0.77 (0.86)	0.92 (0.80)	0.85 (0.79)	$F(2, 75) = .16$, $p = .857$, $\eta^2_p = .004$	*n.s.*
Extrinsic	0.52 (0.58)	0.38 (0.64)	0.85 (0.78)	0.58 (0.69)	$F(2, 75) = 3.02$, $p = .055$, $\eta^2_p = .074$	*n.s.*
Social area						
Friendship	1.67 (1.33)	0.88 (0.65)	0.96 (0.53)	1.18 (0.97)	$F(2, 75) = 5.83$, $p = .004$, $\eta^2_p = .135$	BPAS > BPRES, $p = .009$; BPAS > BPS, $p = .020$
Family	0.37 (0.56)	0.69 (0.68)	0.88 (0.65)	0.65 (0.66)	$F(2, 75) = 4.58$, $p = .013$, $\eta^2_p = .109$	BPS > BPAS, $p = .010$
Partner	0.37 (0.69)	0.19 (0.40)	0.58 (0.58)	0.38 (0.58)	$F(2, 75) = 3.46$, $p = .036$, $\eta^2_p = .085$	BPS > BPRES, $p = .031$
Help	0.22 (0.58)	0.27 (0.53)	0.54 (0.71)	0.34 (0.62)	$F(2, 75) = 2.77$, $p = .069$ $\eta^2_p = .069$	*n.s.*
Leisure area						
Leisure	0.56 (1.01)	0.31 (0.74)	0.65 (0.75)	0.51 (0.85)	$F(2, 75) = 1.74$, $p = .182$, $\eta^2_p = .044$	*n.s.*

Notes: P. features = Positive features.

Table 3. Means (M) and standard deviations (SD) for the features of the essays per condition

Essay features	BPAS M (SD)	BPRES M (SD)	BPS M (SD)	TOTAL M (SD)	ANOVA results	Post-hoc comparisons
Valence	2.96 (2.14)	1.92 (1.98)	1.69 (2.00)	2.25 (2.12)	$F(2,75) = 2.93$, $p = .060$, $\eta^2_p = .072$	BPAS > BPS, $p = .079$[1]
Incongruousness	0.19 (0.62)	0.04 (0.20)	0.77 (1.61)	0.33 (1.03)	$F(2,75) = 3.81$, $p = .027$, $\eta^2_p = .092$	BPS > BPRES, $p = .034$
Sensorial details	0.63 (1.21)	0.04 (0.20)	0.15 (0.78)	0.28 (0.88)	$F(2,75) = 3.54$, $p = .034$, $\eta^2_p = .086$	BPAS > BPRES, $p = .045$
Length	278.78 (92.97)	251.58 (81.41)	249.15 (89.85)	260.08 (88.19)	$F(2,75) = 0.87$, $p = .412$, $\eta^2_p = .023$	*n.s.*

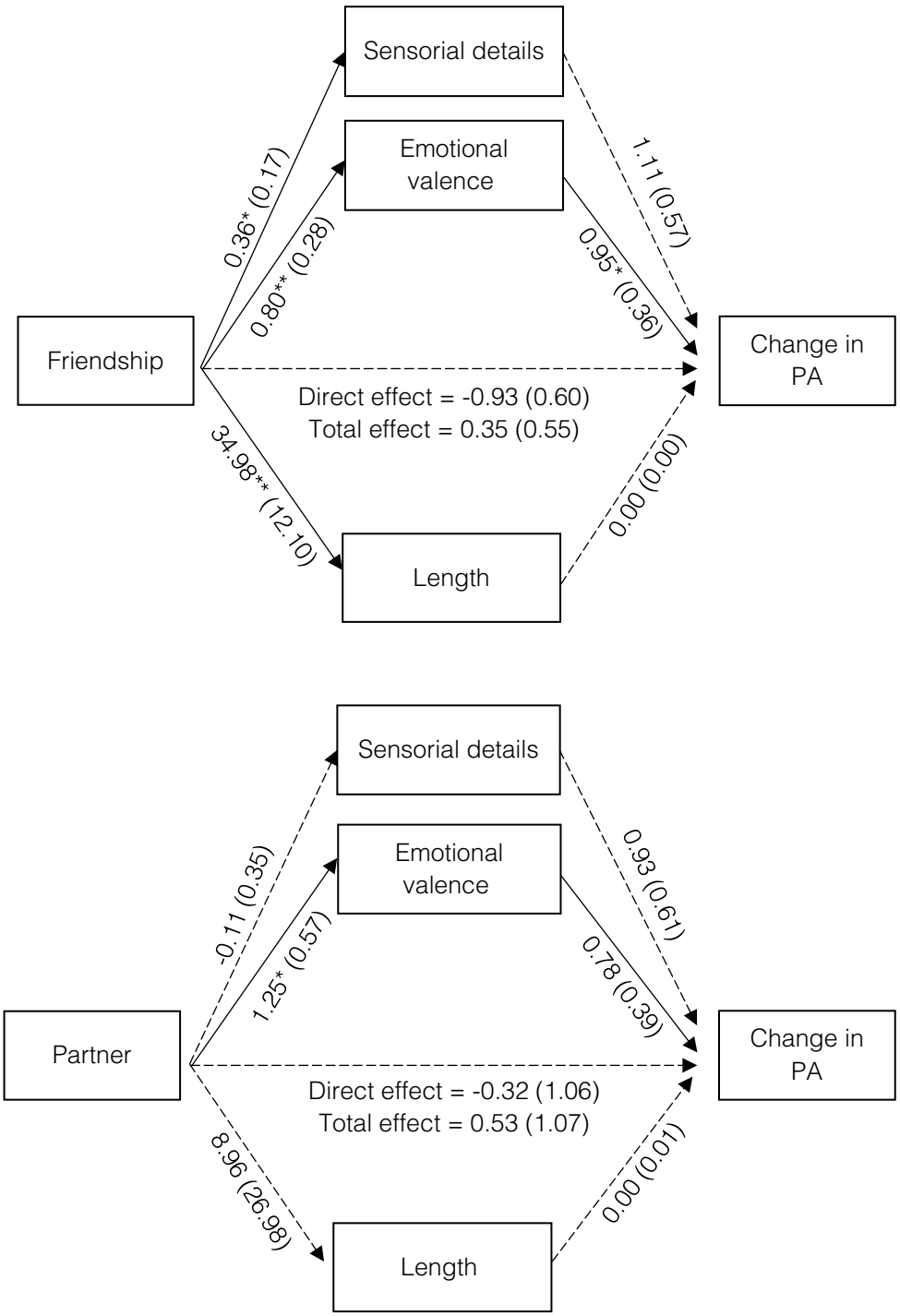
Notes: [1] = Marginally significant

Table 4. Coefficients, Standard Errors (SE) and Confidence Intervals (CI) of the parallel multiple mediations for the significant models.

	BPAS condition				BPS condition			
	Friendship as predictor		*Partner* as predictor		*P. features* as predictor		*Family* as predictor	
	Coefficients (SE)	95% CI	Coefficients (SE)	95% CI	Coefficients (SE)	95% CI	Coefficients (SE)	95% CI
Indirect effects								
Total indirect effect	1.25 (0.59)	[0.28, 2.78]	0.86 (0.94)	[-0.96, 2.75]	0.73 (0.97)	[-0.80, 3.29]	3,30 (1,68)	[0.78, 7.89]
S.P. in Valence	0.76 (0.38)	[0.22, 1.94]	0.98 (0.67)	[0.06, 3.29]	-0.14 (0.39)	[-1.39, 0.36]	0.07 (0.38)	[-0.37, 1.39]
S.P. in Length	0.09 (0.39)	[-0.26, 1.40]	-0.01 (0.19)	[-0.61, 0.14]	1.20 (0.80)	[0.13, 3.95]	2.83 (1.62)	[0.50, 7.64]
S.P. in Sensorial details	0.40 (0.38)	[-0.15, 1.23]	-0.10 (0.52)	[-2.13, 0.48]	-	-	-	-
S.P. in Incongruousness	-	-	-	-	-0.33 (0.44)	[-1.82, 0.16]	0.41 (0.62)	[-0.10, 2.62]
Contrasts								
Valence – Length	0.67 (0.59)	[-0.18, 1.70]	0.99 (0.72)	[0.06, 3.43]	-1.33 (0.97)	[-4.31, -0.02]	-2.75 (1.73)	[-7.76, -0.29]
Valence – Sensorial details	0.35 (0.59)	[-0.48, 1.80]	1.07 (0.75)	[0.02, 3.40]	-	-		
Length – Sensorial details	-0.31 (0.53)	[-1.28, 0.76]	0.08 (0.56)	[-0.80, 1.64]	-	-		
Valence – Incongruousness	-	-	-	-	0.19 (0.62)	[-0.91, 1.61]	-0.33 (0.71)	[-2.26, 0.57]
Length – Incongruousness	-	-	-	-	1,53 (0.84)	[0.30, 3.96]	2.42 (1.76)	[-0.28, 7.45]

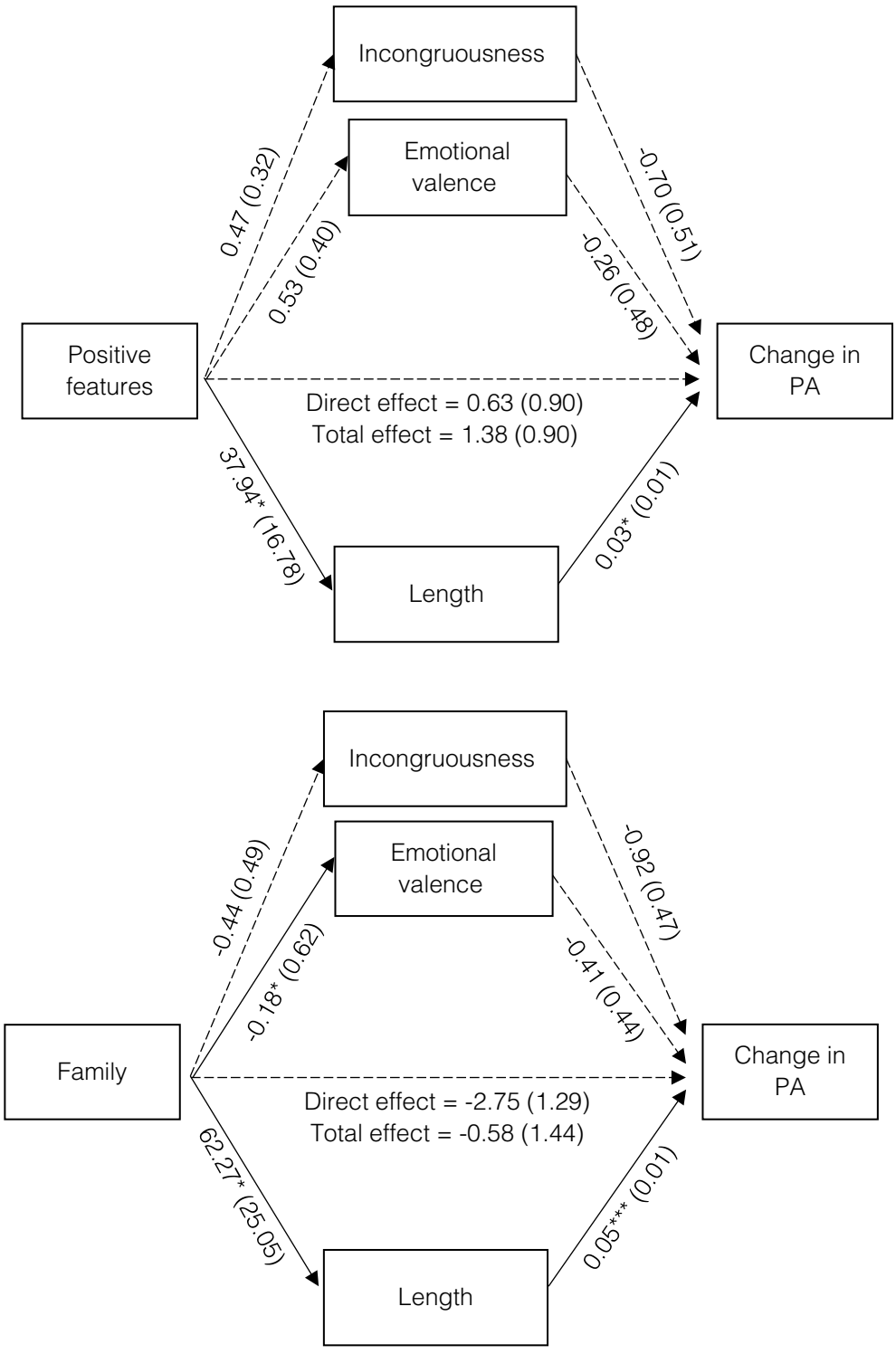
Notes: "Incongruousness" was not included in the analyses in BPAS condition as it appeared in less than 25% of the texts in this condition, and the same procedure was followed for "Sensorial details" in BPS condition. P. features = Positive features. S.P. = Specific change

Figure 1. Parallel multiple mediations between content themes and change in PA through features of the texts in BPAS condition.



Notes: All coefficients represent unstandardized regression coefficients (and standard error in parenthesis). * $p < .05$; ** $p < .01$; *** $p < .001$. PA = Positive affect.

Figure 2. Parallel multiple mediations between content themes and change in PA through features of the texts in BPS condition.



Notes: All coefficients represent unstandardized regression coefficients (and standard error in parenthesis). * $p < .05$; ** $p < .01$; *** $p < .001$. PA = Positive affect.

4. Discussion

This study showed that, despite the similar effects produced by writing about one's best self in the past, present or future on positive mood (Carrillo et al., 2018), these interventions respond to different underlying mechanisms. The procedure of the included PPIs was identical (to write about the best version of oneself), and the only difference between them was the time frame in which participants had to focus on: their past, present or future. Notably, significant differences were found in the content on the compositions depending on the condition. When writing about their best past self (BPAS), participants more frequently included their social relationships with their friends than the other conditions. In addition, they added more sensorial details than the ones who wrote about their present self, which goes in line with previous studies that suggest that recalling past events exhibit more sensorial details than imagining future events, as the latter needs more mental work to supply these (Arnold et al. 2011; Grysman et al. 2013). In the case of participants who wrote about their best present self (BPRES), they talked more frequently about their personal area, including their *skills* more often than in the past condition, and their *positive features* more often than the rest of the conditions. Lastly, when participants wrote about their best possible self in the future (BPS), their texts focused more on their familial relationships, being their *family* more frequently included than in the past condition, and their *partner* more frequently than in the present condition. In addition, they included more incongruousness in their essays comparing with the present condition. Some of these results are in consonance with previous studies about self-descriptions, which showed that participants' descriptions of their current self are more focused on oneself, followed by their past self-descriptions and least of all their future self-descriptions, which were more socially oriented (Shao, Yao, Ceci, & Wang, 2010).

As regards to predictions of change in PA, emotional valence arose as a significant predictor of change in PA in the BPAS texts, whereas the length of the essay and academic or professional theme extrinsically motivated remained as significant predictors of change in PA for participants in the BPS condition.

That is, when writing about their best past self, the more positive the compositions participants wrote, the better results on their levels of positive emotions they obtained. Conversely, when writing about their best possible future self, the more words participants wrote, or the more they included the extrinsic academic or professional theme, the more benefits they achieved on their positive mood levels. In the case of present condition, none of the variables remained as significant predictors.

With respect to mediation analyses, significant indirect effects of *friendship* and *partner* on PA change through emotional valence in the case of BPAS were found. For the BPS condition, significant indirect effects of text length on PA change through *positive features* and *family*. In other words, when participants wrote about their past self and talked about their relationship with their friends or their partners, this led to greater positivity in their texts, which produced improvements in their levels of positive emotions. In the case of participants who wrote about their best possible self, when they focused on their own positive features or their relationships with their family, this produced longer texts, which led to better results in their levels of positive emotions. In the case of participants who wrote about their best current self, no indirect effects were found.

Based on these results, it is possible to conclude that there are differences in the content and form of the compositions of the three PPIs as well as their underlying mechanisms: even that all of them consisted of writing about their best selves, the themes and features of their essays were different, and the factors that predicted and mediated the change in positive emotions were also different. It seems that positive emotional valence in combination with social themes as *friendship* or *partner* plays an important role in the BPAS condition, whereas the length of the essay combined with *positive features* or *family* have an impact on the efficacy of the BPS condition. It is worth to note, however, that the analyses did not find significant results on the BPRES condition. Since emotional valence seems to be a key component of the BPAS condition, it could be beneficial to encourage participants to include as many positive emotional

states as possible when they write about their best past self. However, some participants can feel frustrated if they are not able to naturally include positive emotional states when they are asked to do so. In this case, and based on the results on the mediation analyses, emphasizing the social area (writing about their friends or partner) could indirectly boost the efficacy of this PPI. Following the same rationale, the length of the text is an important factor in the future condition. It is possible to encourage participants to write down as much as possible. However, it is not feasible to know how much they should write, and it is possible that some discomfort reactions of a participant who does not accomplish to write as much as asked could arise. In the same manner, after mediation analyses results, asking participants to focus on their positive features and family relationships in their texts could indirectly amplify the efficacy of the intervention.

This study has some limitations that are necessary to address. First, the sample included was considerably young (M = 20.23, SD = 4.10). Further studies about the content of the texts in a more heterogeneously aged sample are needed, in order to study whether older participants show the same pattern as the ones included in this work. Second, we were not able to find which mechanisms underlie in the efficacy of writing about one's present best self (BRES). It is possible that the term "present self" seemed too broad to participants, which led to an excessively heterogeneous time range to find significant results. Previous research has found that there are significant differences between recalling near and far past events, as well as between imagining near or far future events (D'Argembeau & Van Der Linden 2004; Arnold, Mcdermott & Szpunar 2011). Participants writing about their best self in the present could have focused on their present moment, but it is also possible that some of them included near past or even future time frames, as it was not predefined in the instructions, thus different processes may have been affecting on this condition. Future studies should explore this condition in more detail, either encouraging participants to focus on a specific time frame or exploring which time range they included in their texts.

This work has been the first attempt to study which are the underlying mechanisms of the BPS intervention and the two variants derived from it, and the role that these mechanisms have on their efficacy. There is evidence about PPIs being efficacious resources to improve wellbeing over different populations (Bolier et al., 2013). However, still little is known about the mechanisms that produce those benefits, and qualitative approaches are needed to complement quantitative analyses (Carrillo et al., 2018; Loveday, Lovell, & Jones 2016). This study shed light on the importance of the idiosyncratic features of PPIs in order to better understand why they work, and, as a consequence, how to increment their efficacy. We encourage researchers to continue the investigations on this topic, as a better knowledge about why and how PPIs work will help psychologists and other professionals to make the most of these valuable resources.

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6

General discussion

1. Introduction

The main objective of this dissertation was to analyze the efficacy of the Best Possible Self intervention (BPS) and to explore the factors that have an impact on its efficacy.

With this aim, several studies were conducted. First, a meta-analysis of the efficacy of the BPS was carried out. Second, a study in order to validate a Spanish version of one of the scales that would be used in the following studies was conducted. In addition, this study helped to disentangle the relationship between life satisfaction, including the temporal factor, age, and mood. Third, two randomized controlled trials were carried out in order to test the efficacy of the three temporal versions of the BPS. In order to conduct them, an adaptation was made from the original intervention to the past and present versions, and they were delivered through Information and Communication Technologies (ICTs). Concretely, experimental conditions were enriched with multimedia content and partly delivered through the Internet in the first study, and a completely online method was used in the second study. Fourth, a qualitative study in which the texts of the three variants were analyzed was conducted, in which qualitative and quantitative data were combined in order to shed light on the mechanisms that lie beneath these interventions.

This chapter will summarize the main results obtained in this work and then, the strengths and limitations of this dissertation will be discussed. Next, future directions will be pointed out, and finally, a general conclusion of the whole work will be highlighted.

2. Summary of the main findings

The main results obtained in this work will be presented following the questions that this dissertation was intended to respond.

Is the BPS an efficacious intervention to increase wellbeing?

Chapter 2 presented a meta-analysis and systematic review of the BPS intervention. As far as we know, this is the first meta-analysis that analyzes the efficacy of the BPS. To date, and after almost 20 years since the first study carried out about this intervention (King, 2001), researchers interested in its efficacy had to go through the results of the different individual studies about this positive activity, regardless their specific characteristics. The existing meta-analyses about PPIs in general (Bolier et al., 2013; Sin & Lyubomirsky, 2009) and about interventions intended to increase optimism (Malouff & Schutte, 2016) included some of the published BPS studies, but they included many other interventions unrelated with this one. Therefore, there was an urge to analyze the overall efficacy of this intervention.

The meta-analysis contained in Chapter 2 included 28 studies (in 25 articles) which had empirically tested the intervention comparing with controls and some of them with a gratitude group. The total sample included in this work was 2,863 participants (1,247 in BPS groups, 1,155 in control groups and 461 in gratitude groups).

Results showed that BPS can be considered an effective intervention to increase wellbeing levels compared with controls. Concretely, BPS emerged as an efficacious intervention to improve wellbeing as a single-session (d_+ = .291) and as a larger intervention (d_+ = .381), and it was also efficacious to increase optimism (single session d_+ = .378, intervention d_+ = .278), and to decrease depressive symptoms as a larger intervention (d_+ = .115) compared with controls. Due to the large number of studies which included the Positive and Negative Affect Schedule (PANAS, Watson, Clark, & Tellegen, 1988) specific analyses were carried out, which showed that BPS was also efficacious to improve positive affect (as a single session d_+ = .339, and as a larger intervention d_+ = .657), and to decrease negative affect as a larger intervention (d_+ = .411). Considering the magnitude of the effect sizes obtained, it seems that

BPS shows stronger effects as a shorter intervention (fewer days) except in the case of negative affect, which shows an inverted pattern.

Moderator analyses examined 15 variables, including those related to the sample (type of population, age, country), the delivery method (e.g. online or in person, individually or in groups, and so on), the application of the intervention itself (e.g. explicit visualization component, prescribed length, quantity of minutes per week, and so on), and the methodological quality of the studies. Results showed null significant results on any of them, except for a trend towards significance in the case of age of the sample (years and standard deviation) and the magnitude of the intervention (total of minutes of practice). The obtained results in this regard imply that BPS could be more efficacious for older participants and in more age-diversified samples with more shorter practices (less minutes), although due to the lack of significance, these results should be taken with caution.

As some studies also included an extra group who practiced a gratitude exercise, it was possible to conduct a meta-analysis to compare both BPS and gratitude PPIs. Results showed that BPS was more efficacious than gratitude interventions on positive affect ($d_+ = .326$) and negative affect ($d_+ = .485$).

In sum, this study contributed to the knowledge of the efficacy of the BPS intervention, and it was the first quantitative approach to study its overall efficacy. Results indicate that BPS is a positive activity that can be used to increase wellbeing. It is worth to note, however, that moderator analyses did not show evidence about which factors or mechanisms were involved on its efficacy (except for the aforementioned trend to significance in some variables), which opened the door for future research aimed at disentangling this question. Notwithstanding, these results permit to recommend this activity as an important resource for psychologists and other professionals to increase the levels of wellbeing of their clients.

Is it feasible to measure the temporal life satisfaction in a Spanish-speaking sample?

Chapter 3 contributed to the progress in the assessment of wellbeing and demonstrated that the temporal aspect in subjective wellbeing (SWB) is an important factor to consider in its measurement. Temporal Satisfaction with Life Scale (TSWLS) permits a more accurate assessment of LS, one of the main components of SWB, given that it reduces the measuring error by specifying the temporal frame in which respondents should focus on when answering each item (Pavot, Diener, & Suh, 1998). However, only a few studies analyzed its structure, finding with dissimilar results (McIntosh, 2001; Pavot et al., 1998; Tomás, Galiana, Oliver, Sancho, & Pinazo, 2016; Ye, 2007). In addition, only one study tested its structure in a Spanish sample, yet it was composed uniquely by older participants (Tomás et al., 2016). In addition, this study found a factor structure that did not coincide with any of the previously mentioned studies.

In this Chapter, a Spanish version of the scale was generated and applied in a sample of 491 participants with an age range from 18 to 80 years old (M = 32.07, SD = 14.59).

Confirmatory factor analyses showed that the Spanish version of the TSWLS responded to the same factor structure as other previous studies, each one corresponding to a subscale: past, present and future LS (McIntosh, 2001; Pavot et al., 1998; Ye, 2007). This scale, in addition, exhibited good psychometric properties.

Thus, this study showed that including the temporal aspects of LS emerged as an adequate method to measure LS and that the Spanish version of the scale can be used to assess temporal LS in Spanish-speaking samples.

What is the relationship between temporal life satisfaction, age, and mood?

In addition, Chapter 3 also explored the relationship between temporal LS (past, present, and future) and sociodemographic variables as well as the affective components of SWB (positive and negative mood). Previous studies found diverse results regarding the role of gender and temporal LS (McIntosh, 2001; Pavot et al., 1998; Ye, 2007), and only one study explored how temporal LS behaved through different age stages in a sample of German-speaking women (Proyer, Gander, Wyss, & Ruch, 2011). Existing evidence has consistently found that LS and positive mood are positively correlated, and the opposite results have been found with negative mood (e.g. Kuppens, Realo, & Diener, 2008; Nes et al., 2013), but the knowledge about the nature of this relationship in the case of temporal LS is still scarce. Only the original study (Pavot et al., 1998) and a recent study (Sailer et al., 2014) explored this relationship, and none of them were applied in a sample with a wide age range neither in a Spanish-speaking population. The lack of knowledge about all these factors led to the specific analyses carried out in this Chapter.

Analysis of variance (ANOVA) evidenced that all participants displayed higher levels of present LS than past LS. That is, participants from each developmental stage separately were more satisfied with their present life than with their past life. In addition, older respondents (middle-aged and older adults, that is, people 45 years old and up) presented higher levels of present LS than future LS, and emerging adults (from 18 to 24 years old) showed higher future LS than past LS. Comparing the levels of temporal LS across life stages, results showed that emerging adults (from 18 to 24 years old) scored higher on future LS than middle-aged adults (from 45 to 65 years old). No gender differences were found, in line with previous studies (McIntosh, 2001; Pavot et al., 1998).

Bivariate Pearson's correlations exhibited significant correlations between mood and temporal LS (positive correlations for positive affect and happiness, and negative correlations for negative affect and depressive symptoms).

Regression analyses showed that happiness was a significant predictor of present LS, while positive affect was a predictor of past and future LS. Negative mood played a minor role as a predictor of temporal LS, given that only depressive symptoms added a small percentage to the prediction of present LS, and negative mood did not emerge as a significant predictor in any temporal frame. These results coincide with other studies that used overall LS measures (Diener & Seligman, 2002; Pavot & Diener, 2008) and temporal LS studies (Pavot et al., 1998; Sailer et al., 2014).

The findings of this study cast light on the levels of past, present, and future LS in different age groups, and contributed to clarifying how mood and temporal LS are related. Importantly, differences found regarding age highlight the importance of including the time factor when assessing LS.

In conclusion, to distinguish between different time frames when assessing a broad construct such as LS can contribute to a better understanding of one of the main constituents of SWB, and Chapter 3 showed that this scale permits to do so. It is worth to include the temporality in the assessment of LS, as it can have important implications in different areas of study of the human psyche such as developmental psychology (for example, to measure wellbeing in the elderly), clinical psychology (contributing to a better understanding of different psychopathologies) or positive psychology (producing a more accurate assessment of the efficacy of positive psychology interventions).

Is temporality a relevant factor on the efficacy of the BPS?

The BPS intervention has already shown its efficacy to increase wellbeing in numerous studies (Carrillo et al., 2018; Loveday, Lovell, & Jones, 2016). However, little is known about the factors contribute to its efficacy. This intervention has been generally considered as a future-oriented PPI (e.g. Malouff & Schutte, 2016). Even though temporality has been proposed as a relevant factor of the PPIs (Lyubomirsky & Layous, 2013; Wellenzohn, Proyer, & Ruch,

2016), it is uncertain whether the temporal orientation of the BPS is an essential component for its efficacy.

Chapter 4 aimed at examining the role of temporality through two Randomized Controlled Trials (RCTs) in which the temporal focus of the original BPS was manipulated. Based on previous findings (Wellenzohn et al., 2016), it was expected that all temporal variants would be effective to increase wellbeing and that they would be more effective than the control condition.

In order to carry out both studies, two variants of the BPS were created. The original BPS asks participants to write and visualize about their best self in the future after everything desired has been achieved (King, 2001; Sheldon & Lyubomirsky, 2006). With the original instructions as a starting point, the temporal orientation of the BPS was manipulated, resulting in two new variants: Best Past Self (BPAS) and Best Present Self (BPRES). BPAS consisted of recalling and visualizing oneself in a time in the past when participants considered they displayed the best version of themselves, and BPRES asked participants to visualize themselves in the present, concretely, the best version they offered to the world. These three experimental conditions were compared with a control condition that asked participants to write and visualize the activities that they did during the last 24 hours (Enrique, Bretón-López, Juana; Molinari, Baños, & Botella, 2017; Meevissen et al., 2011; Sheldon & Lyubomirsky, 2006).

In both studies, participants were randomized to one of four conditions (BPAS, BPRES, BPS or control) and were encouraged to practice the exercise for 7 days. Study 1 (N = 112) was applied in a sample of University students with a blended design (the first day was carried out in the laboratory, and during the following days participants practiced through the Internet), and Study 2 (N = 108) was applied in the general population with a completely online design.

Results showed similar outcomes in both studies, confirming the first hypothesis of the Chapter: positive affect, happiness, self-efficacy, optimism and temporal

LS significantly increased and negative affect significantly decreased after a week of practice in all temporal variants in Study 1. BPRES and BPS produced significant increases in self-satisfaction. In Study 2, similar results were found except for optimism. Within-group effect sizes in Study 1 pointed out significant results in the experimental conditions, in contrast with the control condition, which did not show any significant within-group effect size. In Study 2, a similar pattern emerged, although the control condition showed a significant effect size in one of the variables.

It is worth to mention that no differences were found between experimental and control conditions, thus the second hypothesis outlined in Chapter 4 about the superiority of the experimental conditions over the control condition was not confirmed, given that the control condition also produced increases in wellbeing outcomes. As previously stated, there are several reasons why these outcomes could be found.

On the one hand, the active pursuit to increase one's wellbeing levels could have directed participants towards the activation of positive self-relevant information (Mongrain & Anselmo-Matthews, 2012). This could be done by engaging in processes that typically belong to some types of PPIs, such as increasing their feelings of self-efficacy by being aware of all the things they managed to carry out during the day (Schutte, 2014), actively engaging in a savoring exercise when they recalled their activities of the last 24 hours (Bryant & Veroff, 2007), or appreciating all the little things that happen in their ordinary days through a grateful reflection (Davis et al., 2016).

On the other hand, it is possible that there was a lack of sufficient statistical power to find significant results. It has been widely found that statistically significant results, using p-values, are directly dependent on sample sizes (Gerber & Malhotra, 2008; Kühberger, Fritz, & Scherndl, 2014). On the contrary, effect sizes are a measure of the strength of a phenomenon which estimates the magnitude of a relationship and they are not strictly dependent of the sample sizes (Kühberger et al., 2014). Within-group effect sizes in Chapter 4 suggest

that it is possible that, with a larger sample, some significant differences would have emerged, given that control condition did not show any significant within-group effect size in Study 1, and only a significant effect size on self-efficacy in Study 2.

This is the first study that analyzed the role that the temporal focus has on the efficacy of the BPS intervention. Results suggest that temporality does not play a significant role in terms of the efficacy of the intervention: all variants produced improvements in wellbeing measures. Hence, it seems that the temporality of the BPS is not an essential feature for the efficacy of the intervention. However, these results need to be replicated as no significant differences emerged among conditions, but different within-group effect sizes were found. Nevertheless, as Chapter 5 highlighted, the mechanisms that underlie the three variants seem to be different.

Are the past, present and future best selves scalable and disseminable interventions?

Positive Psychology Interventions (PPIs) have taken advantage of the development of ICTs. Online Positive Psychology Interventions (OPPIs) come with advantages such as better cost-effectiveness, higher rates of participants' engagement, or high accessibility, among others (Mitchell, Vella-Brodrick, & Klein, 2010). Various studies have already shown that it is feasible to implement PPIs through the Internet (e.g. Drozd, Mork, Nielsen, Raeder, & Bjørkli, 2014; Proyer, Gander, Wellenzohn, & Ruch, 2016), including BPS studies (e.g. Layous et al., 2013; Manthey, Vehreschild, & Renner, 2016).

Chapter 4 included two RCTs that shared the same design except for the technologies used in their implementation. In both studies, participants learned one of the three versions of the BPS (past, present, or future) or the daily activities exercise (control condition). They wrote down the content of their essay on the first day, and then visualized the content during the rest of the week (in the case

of the control condition, they had to write and visualize every day given the changing nature of the content of their essays). Measures were taken prior to the first practice and after 7 days of prescribed practice.

In the case of Study 1, participants learned the exercise in the laboratory on the first day, and then they practiced the exercise online for a week through a specific web page. In the case of Study 2, participants did not have any personal contact with the research team, the instructions were delivered in the form of simple and short videos, and they learned the exercise online. Although the assessment was not exactly equivalent (as Study 2 reduced the number of questions in order to lessen the burden produced by the assessment), the rest of the design was equal.

As aforementioned, both studies found very similar results regarding the efficacy of the included interventions. That is, Study 2 was able to replicate the findings of Study 1. These results suggest that the adaptation to an online format of the instructions and the methodology was effective and that it is feasible to deliver the interventions included in the studies as self-applied OPPIs.

What are the underlying mechanisms of the BPS intervention and its temporal variants?

Despite the evidence about the efficacy of the BPS intervention, little is known about how this positive activity works (Carrillo et al., 2018; Loveday et al., 2016). Several studies have attempted to analyze the content of the texts of participants who practice this intervention, although none of them have analyzed the role that the content of the essays has on the efficacy of the intervention to increase wellbeing (Hill, Terrell, Arellano, Schuetz, & Nagoshi, 2015; Loveday, Lovell, & Jones, 2017). Thus, it is unknown whether the content of the BPS is an important feature for its efficacy, and if so, how both factors (its content and the outcomes produced in wellbeing) are related. That is, the mechanisms that underlie its efficacy are still unknown.

Chapter 5 analyzed the content of the texts of the BPS and its temporal variants, in order to explore their characteristics and how they were associated to the efficacy of the interventions to increase positive affect, one of the main outcomes used in previous studies (Carrillo et al., 2018).

Following the consensual qualitative research-modified method (CQR-M, Spangler, Liu, & Hill, 2012), the texts of the three interventions used in Study 1 (Chapter 4) were analyzed. Several themes and features of the texts, which represented the core ideas contained in the different essays, were extracted by two independent coders. Kappa values showed high levels of agreement.

The themes identified in the texts were categorized into four areas. The personal area included *positive features* (expressions of a personal improvement in one's trait or psychological ability, or an already present positive feature that remained constant), *skills* (the presence of an ability or the willingness to learn a new ability), and *health* (efforts to influence on one's physical health). The professional/academic area was composed of *intrinsic* (intrinsic motivation) and *extrinsic* (extrinsic motivation). The social area included *friendship* (social relationships with friends or colleagues), *family* (relationships with members of the family), *partner* (romantic relationships) and *help* (willingness to or actions aimed at helping other people in different contexts). Finally, leisure area included the *leisure* theme (free time or hobbies).

In addition, the features of the texts considered were: length of the essay (total number of words), quantity of sensorial details, emotional valence of the essay (the subtraction of the total number of positive emotional states), and incongruousness (phrases in which participants talked about a positive feature explicitly expressed as no longer present or the willingness to reduce or eliminate the presence of a personal feature).

The most frequent themes of the texts on the three conditions together were *positive features*, *friendship*, and *intrinsic.* The least frequent ones were *skills, health, partner* and *help*.

Multivariate analysis of variance (MANOVAs) and independent separate univariate ANOVAs showed that, regarding the personal area, *positive features* appeared more frequently in BPRES than in BPAS and BPS, and *skills* was more frequent in BPRES than in BPAS. Regarding the social area, *friendship* was more frequent in BPAS than in BPRES and BPS, *family* appeared more often in BPS than BPAS, and *partner* emerged more frequently in the texts in BPS than in BPRES. In addition, the number of sensorial details was higher in BPAS than in BPRES texts, and incongruousness appeared significantly more times in BPS than in BPRES. A tendency to reach significance suggested that the valence of the essays was more positive in BPAS than in BPS.

Stepwise regression analyses revealed that emotional valence predicted the change in positive affect in the BPAS condition and that the length of the essay and the *extrinsic* theme predicted change in positive affect for BPS condition. In the case of BPRES, no variable remained as significant predictor.

To finish, mediation analyses showed that emotional valence mediated the effects of the themes of *friendship* and *partner* on the change in positive affect in the BPAS condition. In addition, the length of the essay mediated the effects of the themes of *positive features* and *family* in the case of the BPS condition. Again, no significant results were found for the BPRES condition. In sum, these results suggest that, when participants in the BPAS condition wrote about the themes of *friendship* and *partner*, they wrote more positive texts, which produced higher changes in positive affect. In the same manner, when participants in BPS condition wrote about their *positive features* or *family*, they wrote longer texts, which produced higher changes in positive affect.

As far as we know, this was the first attempt to combine the content of the texts of the BPS interventions and its efficacy to increase positive affect. This study revealed that, despite the similar effects produced in positive affect by writing about one's best self in the past, present or future found in Chapter 4, these interventions respond to different underlying mechanisms. That is, there are differences in the content and form of the compositions of the three interventions

and, most importantly, these differences seem to predict the change in positive affect depending on the condition. It is worth to mention, however, that no significant outcomes emerged for the BPRES condition.

Although other variables not included in this study may also influence the efficacy of these interventions, this Chapter contributed to shed light on the processes that take place then participants are asked to write about their best selves and how these processes influence the efficacy of the interventions to increase positive affect. These results have important implications, as they can be used to increment the effects on positive affect obtained by the different variants by encouraging participants to emphasize specific contents and features in the elaboration of their essays.

3. Strengths

This dissertation has several strengths that are worth to highlight in order to fully interpret the main findings:

- This work is composed of different studies which have followed high methodological standards. Through a rigorous methodology, the meta-analysis presented in Chapter 2 served as a starting point to the subsequent studies of this dissertation. It followed the PRISMA guidelines and used the most advanced methodology in order to shed light on the efficacy of the intervention. Chapter 3 contributed to the progress of a more accurate assessment of wellbeing. Chapter 4 included two studies that were RCTs with a priori sample size calculation, which are basic requirements in order to be able to achieve conclusions derived from causal relationships. To finish, Chapter 5 innovated in the assessment of the efficacy of the PPIs by a mixed-method design.

- To our knowledge, this dissertation includes the first examination of the role of the temporal orientation in the efficacy of the BPS intervention. In addition, this examination was carried out through two RTCs that found similar results.

- The inclusion of two RCTs in Chapter 4 with different levels of implantation of ICTs permits us to compare the feasibility and efficacy of a blended versus an online design.

- This work also includes the first study about the mechanisms that take place in the elaboration of the best self (past, present, or future) and how these mechanisms are related with the increases in positive affect produced by the interventions. In addition, the study of these mechanisms can be used to boost the outcomes produced by the aforementioned activities.

4. Limitations

This work has also limitations that should be discussed. After the individual limitations of the different studies already discussed in previous sections, some general limitations of this dissertation can be pointed out:

- Even that the minimum sample size needed was calculated for Study1 and Study 2 in Chapter 4, it is possible that including larger samples could have helped to provide more generalizable results of the efficacy of the temporal variants of the BPS, as results suggest a possible lack of statistical power.

- Although Chapter 3 included a sample with a relatively wide age range and showed that age seemed an important factor on SWB, the included samples in the subsequent studies in Chapter 4 were considerable young. This limitation impedes to analyze the role of age in the efficacy of the included interventions in Study 1 and Study 2.

- The samples included in this dissertation are University students and the general population. These types of samples are expected to present higher

levels of wellbeing compared with other populations such as subclinical and clinical patients. Therefore, they may not experiment great benefits partly because of the ceiling effect, which may have buffered the obtained results.

- Chapter 4 did not include follow-up measurements. Some studies have found that some PPIs are able to maintain the benefits produced in the long term in follow-up assessments compared with controls (Cohn & Fredrickson, 2010; Page & Vella-Brodrick, 2013). In this work, the lack of follow-up assessments does not permit to analyze the long-term effects produced by the interventions.

- Chapter 5 partially helped us to shed light on the processes that cannot be obtained by the quantitative data, but it only included the texts of Study 1 and only one quantitative measure (positive affect). Replicating the findings with the texts of Study 2 as well as to include other quantitative measures would help to advance in this topic.

5. Future directions

Science grows continuously: answers provided by previous research lead to new research questions, and so on. This dissertation helped to answer some of the questions about the factors that play a role on a well-validated PPI. However, much more is still unknown and further research is needed.

First, it is uncertain whether the there are other factors related to the content of the BPS intervention that might influence the observed effects. Moderator analyses in Chapter 2 did not show significant results, the two RCTs of Chapter 4 found similar efficacy on the three variants, and Chapter 5 helped to shed light on different mechanisms that may act under the different variants. However, this research only explored the role of temporality in this intervention, and it is likely that other factors related to the content of the intervention may also play part in its efficacy. As previously mentioned, the activation of positive self-relevant

information might be a relevant factor in the efficacy of different interventions and even some control conditions (Mongrain & Anselmo-Matthews, 2012). Future studies that compare the activation of another type of content not self-related while maintaining the same structure (for example, writing about others' best selves), may contribute to answer this remaining question.

Second, control conditions should be thoroughly studied. What constitutes a control condition in Positive Psychology needs to be clarified and specifically manipulated. While control conditions are not defined, *per se*, as activities aimed at increasing wellbeing (although participants do receive that prompt), they produced benefits in this dissertation and other previous studies (e.g. King, 2001; Mongrain & Anselmo-Matthews, 2012; Seligman, Steen, Park, & Peterson, 2005). It is still unknown whether these cases have produced positive results as a mere result of the placebo effect (Kirsch, 2005), or if they share something in common with some PPIs (Mongrain & Anselmo-Matthews, 2012). As it can be seen, control conditions seem to rely on (still) unidentified factors that need to be further explored through different approaches, such as direct manipulations of specific features of the control exercises, qualitative analyses of their essays, or explicit questions about what participants do in order to perform them.

Third, given that SWB levels are sensitive to age (Pavot & Diener, 2008; Pavot et al., 1998), and that PPIs related to different time focus may work differently among different age stages (Lyubomirsky & Layous, 2013), temporality and age are two factors likely to be interrelated and that should be further studied. BPS and its temporal variants would permit to explore this association and the possible differences that could emerge, given that the only difference between them is the temporal focus. Future studies could analyze the effects found by these interventions depending on age with larger samples that include more comprehensively different age stages.

Fourth, there are personal variables that have been associated with the efficacy of the interventions, such as personality traits, motivation, or baseline mood levels (e.g. Antoine, Dauvier, Andreotti, & Congard, 2018; Lyubomirsky &

Layous, 2013; Wellenzohn et al., 2016). As previously stated, this work relied on samples of University students and the general population. It would be highly relevant to analyze whether stronger effects could be found in samples with lower levels of positive affect such as subclinical depressive patients, as these populations may have a bigger room for improvement and the ceiling effect would less likely buffer the obtained results (Davis et al., 2016; Froh, Kashdan, Ozimkowski, & Miller, 2009). Indeed, PPIs have expanded their initial attempts to increase wellbeing levels to the general population to clinical patients, and there are already published studies which have found that PPIs can increase wellbeing and reduce depressive symptoms in patients with different clinical conditions (Alden & Trew, 2013; Bolier et al., 2013; Pietrowsky & Mikutta, 2012). In this sense, BPS and its temporal variants could help patients to achieve a more positive outlook about themselves along the complete lifespan, which could help them to increase their wellbeing levels.

Fifth, technologies still have a lot to offer in the field of PPIs. The interventions included in this dissertation were adapted from a traditional format to an online format with similar results, which led us to conclude that they can be implemented through the Internet, with the consequent benefits in cost-effectiveness. Mobile apps constitute one of the newest and more promising resources to implement behavioral interventions, as the use of smartphones has substituted the use of computers in many ways. This progress points out the way to the next step: adapting and implementing PPIs through mobile apps. Indeed, there are already published studies with promising results, which have shown that mobile apps can be a feasible way to implement PPIs (e.g. Daugherty et al., 2018). The interventions used in this dissertation can also take advantage of mobile technology: the activities used in this work needed participants to be daily involved in the exercise through a computer, and it is likely that, in future studies, the use of a smartphone could have benefits when implementing these interventions. A mobile app could help participants to engage in the practice every day by sending them reminders and allowing them to practice within the smartphone itself at any time in any place, which in turn could produce higher

levels of involvement in the exercises, and maybe, even stronger results on wellbeing increases.

Sixth, it would be highly relevant to test the effects of different combinations of the BPS variants. Along with this work, the three temporal variants showed similar results on wellbeing increases, which suggest that it may be sufficient to promote a positive outlook about oneself in any temporal frame. Interestingly, the content of these variants does not overlap: although they are aimed at producing a positive vision about oneself, they are focused on different time frames. Therefore, it is possible that combining all variants in a more inclusive intervention would be more effective to increase wellbeing, and that developing each variant would help to construct the others (e.g. to visualize one's best past self would probably help to construct one's best present self). Following the broaden-and-build theory, the construction of one best self in the past, the present, and the future could produce higher benefits on wellbeing increases, especially through an enhancement in self-efficacy, which, in turn, could help to increase one's personal resources in the long term (Fredrickson, 2001; Schutte, 2014).

Finally, it is worth to mention that this dissertation led to new projects related to the future directions pointed out in this discussion. University of Valencia researchers in collaboration with Twente University and Trimbos Institute researchers have been working to develop a new project that aims to test whether the combination of the interventions included in this work is more effective to increase wellbeing levels than the original BPS intervention. In addition, and to make use of the advantages of smartphones, the interventions will be applied through a mobile app specifically designed to deliver them. In order to carry out this project, the interventions were again adapted as a first step, this time to a smartphone format. Exercises will be delivered in the form of imagery audio-instructions and supported by an avatar, who will guide participants through the whole intervention. It is worth to note that this work is currently in progress: the project is already designed (as well as the smartphone

app) and it is already approved by the ethical committee of the University of Twente (16337) and registered in the United States National Institute of Health Registration System (NCT03072680). It is expected that this work will be launched in the Netherlands in the following months.

6. Conclusion

In conclusion, this dissertation contributed to the knowledge of a widely used PPI, and to answer the novel questions about how PPIs work. Concretely, it produced the following results:

1. BPS is an efficacious intervention to increase wellbeing levels, positive affect, and optimism, and to decrease depressive symptoms and negative affect.
2. Temporality is a relevant factor in the assessment of life satisfaction.
3. Temporality does not seem to directly affect the efficacy of the BPS intervention.
4. Control conditions may not be as innocuous as expected given that they produced benefits in wellbeing.
5. ICTs are valuable resources to implement the BPS intervention and its variants.
6. The mechanisms that underlie the three temporal versions of the BPS are different.

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