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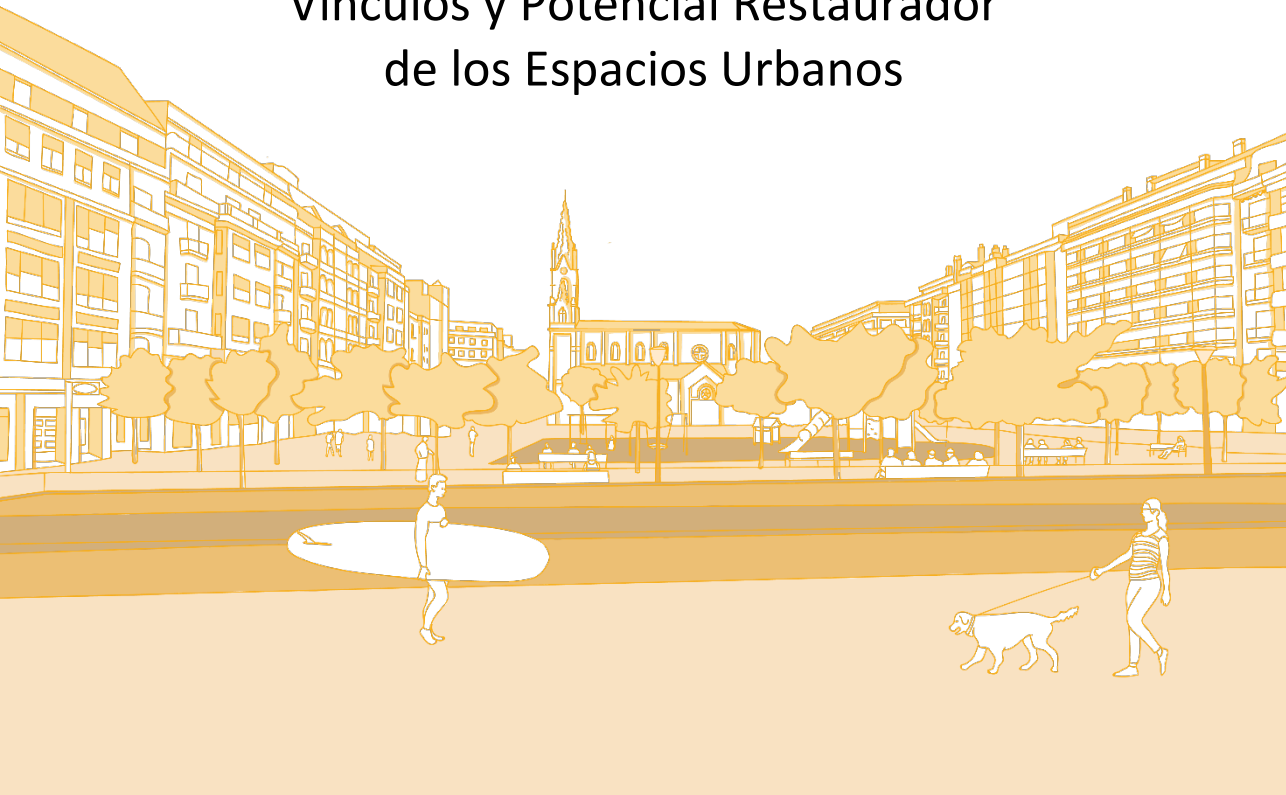


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Bonding and Restorative Potential of Urban Spaces

Vínculos y Potencial Restaurador de los Espacios Urbanos



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BONDING AND RESTORATIVE POTENTIAL OF URBAN SPACES

VÍNCULOS Y POTENCIAL RESTAURADOR DE LOS ESPACIOS
URBANOS

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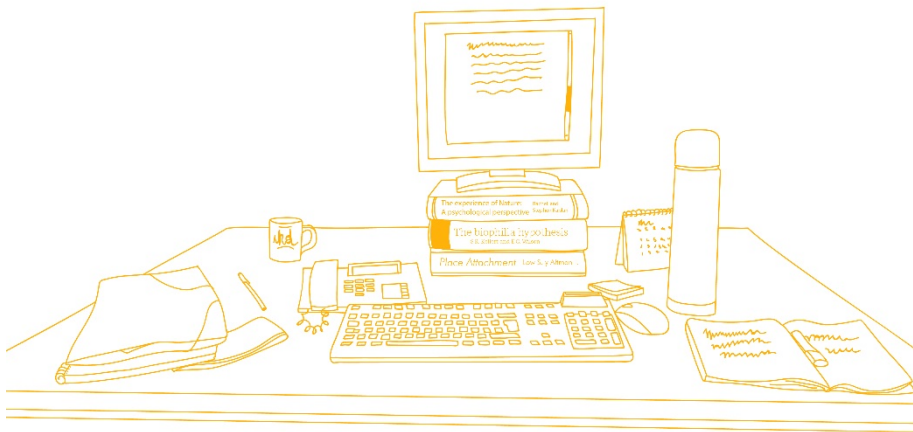
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CAPÍTULO 0 COORDENADAS TEÓRICAS, ESTRUCTURA Y OBJETIVOS DEL TRABAJO

El trabajo que tiene entre manos es una tesis en formato “compendio de artículos”. En este primer capítulo se expondrán las principales coordenadas teóricas del trabajo de forma resumida, presentando brevemente las teorías y resultados de investigaciones previas. Dicho contenido será complementado por las introducciones teóricas de cada uno de los capítulos empíricos (capítulos 1-7) en los que se incidirá en los aspectos más relevantes para cada uno de los estudios que en ellos se presentarán.

0.1 Restauración psicológica: teorías y estado del arte

Bratman, Hamilton y Daily (2012) afirman que a través de la historia, diferentes culturas han señalado la influencia positiva de la naturaleza en el bienestar humano. Refieren que, ya en la Edad Media se habilitaban jardines y áreas naturales en los dispensarios y hospitales, tradición que se consolidó más tarde en el diseño de hospitales en Inglaterra, Alemania y Francia en los siglos XVII-XIX. Los trabajos de de Frederick Law Olmsted, arquitecto y paisajista, señalaban el valor terapéutico de los parques y espacios verdes. Olmsted sugería que podrían ser utilizados para desconectar y relajarse tras el trabajo (1870, p.230) o ser prescritos¹ para mejorar la salud de pacientes aquejados de dolencias físicas o psicológicas (1870, p.244).

Tal y como escriben Capaldi y colaboradores, tres son las teorías principales que han tratado de explicar los beneficios psicológicos que produce el contacto con la naturaleza: la Hipótesis de la Biofilia, la Teoría de la Restauración de la Atención y la Teoría de Recuperación del Estrés (Capaldi, Passmore, Nisbet, Zelenski, y Dopko, 2015). La primera de ellas

¹ Esta idea se encuentra también presente en escritos actuales sobre restauración (Korpela & Ylén, 2009).

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plantea que la especie humana se encontraría innatamente vinculada a los entornos naturales, dado que en ellos se produjo su evolución. Esta conexión se produciría especialmente con aquellos elementos que hubieran estado ligados a la supervivencia de la especie (Kellert y Wilson, 1993), principalmente vegetación y agua². Por lo tanto, dichos beneficios serían una suerte de consecuencia derivada de estar en contacto con los entornos primigenios, aquellos para los cuáles nuestro cuerpo y funciones mentales estarían optimizados.

La Teoría de Restauración de la Atención³ (ART, en sus siglas en inglés, de aquí en adelante) propone una explicación cognitiva para dichos beneficios (Kaplan y Kaplan, 1989). Para responder a las demandas constantes del entorno, explican los autores, las personas ponemos en juego nuestra capacidad de atención directa o voluntaria, que nos permitiría discriminar entre los estímulos que nos rodean, prestar atención a los que son relevantes y realizar las tareas que sean requeridas en cada momento. Este recurso psicológico, limitado, tendería a reducirse o agotarse con el paso del tiempo y por tanto se incrementaría el esfuerzo requerido para seguir respondiendo a dichas demandas, aumentaría la comisión de fallos y podrían aparecer sentimientos de frustración, irritación o ansiedad. La superación de este estado deficitario, conocido como fatiga atencional, vendría dada por el

² Esta consideración ha dado lugar a los conceptos de fitofilia e hidrofilia. Para una descripción breve de cada uno consúltese Joye y van den Berg (2011, p.266) y Foley y Kistemann (2015) respectivamente.

³ Para mayor información acerca de las características que definen a los espacios restauradores consúltense las páginas 43, 45 y 72. Para información sobre las fases del proceso restaurador, las páginas 43-45 y 137-138. Para una visión crítica de esta teoría, véanse las páginas 158-161.

contacto con espacios naturales que permitieran descansar los mecanismos cognitivos relacionados con la atención directa. Esto se produciría, siempre según los autores, porque los estímulos naturales generarían una suerte de fascinación que activaría mecanismos indirectos e involuntarios de atención dejando en reposo a los voluntarios y directos.

Por su parte, la Teoría de Recuperación del Estrés⁴ (SRT, en sus siglas en inglés, de aquí en adelante) plantea que la respuesta de estrés ante determinados eventos o situaciones lleva al organismo a una situación de fatiga emocional causada por la movilización de recursos psico-fisiológicos destinados a la resolución de la situación (Ulrich, 1993; Ulrich et al., 1991). Según el autor, el contacto con espacios naturales que cumplieren unas determinadas características elicitaría una rápida respuesta fisiológica que sustituiría los afectos negativos experimentados por otros de corte positivo.

Tanto la ART como la SRT coinciden en que la respuesta a las demandas de la vida cotidiana requiere del empleo de recursos psicológicos y, que al agotarse éstos, las personas entran en un estado de fatiga mental y afectiva del que pueden recuperarse al entrar en contacto con espacios naturales. Sin embargo, discrepan: 1) en la definición del proceso de restauración, para una de naturaleza eminentemente cognitiva y para la otra, afectiva⁵, 2) en las características que configuran los espacios restauradores

⁴ En las páginas 42, 43 y 73 se explican las características definitorias de los entornos restauradores según la SRT. Para una visión crítica de esta teoría, véase las páginas 158-161.

⁵ Tanto es así que, a pesar de que cada teoría reconoce los efectos de la experiencia restauradora descritos en la otra, los supedita a su centro de interés (Bratman, Hamilton, & Daily, 2012; véase también Kaplan, 1995)

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y, 3) en la duración del proceso de restauración. A pesar de lo anterior, ambas teorías son relativamente complementarias (Berto, 2014) y, en la práctica, las investigaciones tienden a integrar los postulados de ambas (Von Lindern, Bauer, Frick, Hunziker, y Hartig, 2013). Un claro ejemplo de ello es la definición de restauración propuesta por el profesor Hartig en uno de sus trabajos, en el que la define como el proceso de recuperación de los recursos físicos, psicológicos y sociales disminuidos por la respuesta a las demandas cotidianas (Hartig, 2004).

Recientemente varios meta-análisis han tratado de condensar la evidencia disponible acerca del proceso de la restauración psicológica⁶. Bowler y colaboradores recopilaron un total de 25 estudios experimentales encontrando efectos consistentes de la exposición a entornos naturales en la reducción de la ansiedad, el enfado, la fatiga y la tristeza, así como incrementos en la energía percibida (Bowler, Buyung-Ali, Knight, y Pullin, 2010). Sin embargo, los efectos en las medidas atencionales – solo recogidas en tres de los estudios- fueron inconsistentes. El meta-análisis de McMahan y Estes, (2015), que condensó la evidencia proveniente de 32 estudios experimentales tanto de laboratorio como de campo, mostró un efecto global de tamaño moderado ($r = .31$) para el incremento del afecto positivo y uno de tamaño pequeño ($r = -.12$) para la reducción del afecto negativo. En el caso de la restauración de la atención, un meta-análisis específico de 31 estudios encontró efectos positivos significativos en solo 3 de las 10 medidas

⁶ Aquí la atención se centra en estudios experimentales o cuasi-experimentales pretest-posttest ya que son, en comparación con los diseños de encuesta, los más adecuados para conocer de forma acertada la magnitud e implicaciones de la restauración psicológica.

distintas utilizadas – *cambio medio puntuación* = 0.39 - 6.71- (Ohly et al., 2016). Por último, una revisión narrativa de 17 estudios que analizaron el efecto fisiológico de la exposición a entornos naturales informaba de efectos positivos, significativos y consistentes en variables de tipo cardiovascular, endocrino e inmunitarias (Haluza, Schönbauer, y Cervinka, 2014).

Del párrafo anterior se pueden extraer las siguientes conclusiones. En primer lugar, el número de estudios experimentales pretest-posttest es ciertamente reducido para una línea de investigación con más de 40 años de historia, sobre todo teniendo en cuenta que muchos de ellos se han realizado por medio de metodologías de laboratorio (p.ej. visionado de vídeos). En segundo que, a pesar de la rotundidad de las premisas básicas de las teorías de la restauración, los efectos de la exposición a entornos naturales parecen ser de tamaño reducido. Esto último es todavía más remarcable para el caso de la restauración atencional, en la que solo se encuentran efectos significativos en una minoría de las medidas normalmente utilizadas (Ohly et al., 2016). Ciertamente, la realización de un mayor número de estudios de este tipo con cuidada validez ecológica y su posterior síntesis permitiría valorar adecuadamente la magnitud de este proceso psicológico. Es también relevante la constatación de que, en la esfera cognitiva, las diferentes herramientas utilizadas pueden estar midiendo procesos cognitivos distintos (p.ej. atención sostenida/inhibida, memoria de trabajo o funciones ejecutivas) y que se hace necesario un acuerdo científico para establecer cuáles serían las más adecuadas y utilizarlas de forma consistente en las futuras investigaciones (también señalado en Bringslimark, Hartig, y Patil, 2009).

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Por tanto, y como cierre a este primer epígrafe, podría argumentarse que, si bien la psicología de la restauración tiene una presencia relevante en la literatura de disciplinas como la Psicología Ambiental, el Planeamiento Urbano y la Salud Pública, muchos de sus postulados puede que no estén lo suficientemente asentados en evidencia de calidad. Por tanto, parece necesario profundizar en mayor medida para poder obtener un conocimiento más preciso y poder así inspirar políticas e iniciativas con garantías.

0.2 -La restauración urbana: premisas teóricas, contexto e importancia.

En los textos en los que se propusieron la ART y la SRT (Kaplan y Kaplan, 1989; Ulrich, 1981, 1993) se establecía una clara diferencia entre la capacidad restauradora de los entornos naturales y los construidos. La naturaleza fue definida como el entorno restaurador por excelencia y la ciudad como un entorno generador de todo lo contrario: estrés, fatiga mental y malestar psicológico. Además de la ART y la SRT, en el último tercio del siglo XX se desarrollaron también otras teorías explicativas de las interacciones personas-entornos y de las preferencias ambientales con perspectiva evolutiva (Appleton, 1975; Kellert y Wilson, 1993; Orians y Heerwagen, 1992). En su conjunto, estos trabajos mantenían una concepción muy determinada de la experiencia humana en los entornos urbanos. Ésta podría ser recogida bajo la Hipótesis del lag adaptativo (Joye y van den Berg, 2011), que propone que nuestras funciones mentales estarían adaptadas y optimizadas para la vida en la naturaleza ya que éste es el entorno en el que se produjo la evolución de la especie. Por tanto, las consecuencias negativas de la vida en la ciudad (Marsella, 1998; Milgram, 1970; Nelson, Schwirian, &

Schwirian, 1998; Ulrich, 1981; Ulrich et al., 1991) vendrían dadas por un desajuste de nuestro organismo con el entorno en el que habita desde hace pocos siglos. Quizá este planteamiento podría resumirse con la idea de que el ser humano estaría obligado a vivir en un entorno al que todavía no se habría adaptado.

No es de extrañar que las teorías anteriores duden del potencial restaurador de los espacios urbanos. Durante el último siglo, las Ciencias Sociales y de la Salud se han caracterizado por tener una imagen negativa o pesimista de las ciudades y de la vida en ellas (Fernandez-Ramírez, 2010; Páramo, 2017). En términos generales, se ha entendido que los/as urbanitas se encontraban expuestos/as a mayores niveles de estresores ambientales como el ruido, la contaminación o los elevados niveles de densidad poblacional (Collado, Staats, Corraliza, & Hartig, 2017; Moser, 2014). Ejemplos de esto serían las investigaciones que han relacionado los niveles de urbanización con la prevalencia de malestar psicológico, psicopatologías o delincuencia (Corcoran et al., 2017; Faris y Dunham, 1939; Marsella, 1998; Nelson et al., 1998; Vozmediano & San Juan, 2010). En su libro *The Urban Experience*, Claude S. Fischer (1984) describe que el pensamiento social acerca de las ciudades a lo largo del pasado siglo⁷ ha estado caracterizado por la concepción de que éstas son entornos hostiles para el ser humano,

⁷ Este autor rastrea visiones negativistas de la ciudad en nuestra cultura a lo largo de toda la historia y la cultura (Fischer, 1984, p. 13-14). La dicotomía naturaleza *versus* vida urbana, percibiéndose la segunda menos virtuosa, se encuentra en las tradiciones griega y latina y ha estado presente asimismo durante el Renacimiento y la Edad Moderna. También la tradición religiosa abunda, a excepción de la Jerusalén celestial, en el predominio del pecado en las ciudades bíblicas (p.ej. Sodoma y Gomorra).

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que causan estrés y alienación, fracturan las relaciones sociales y fomentan en sus habitantes personalidades frías, calculadoras e interesadas.

La dicotomía naturaleza-ciudad ha estado muy presente, y sigue estándolo, en los estudios sobre restauración psicológica. Tal y como ha sido apuntado por otros autores, habría de ser superada (Karmanov & Hamel, 2008; Sörqvist, 2016; Staats, Jahncke, Herzog, & Hartig, 2016) en pos de un mejor conocimiento científico y con vistas a la mejora de la calidad de vida urbana.

Más allá de estas disquisiciones académicas sobre los planteamientos de las teorías de la restauración, la relevancia aplicada del estudio de la restauración urbana se fundamenta en dos motivos:

Sostenibilidad y mitigación de efectos del cambio climático

El estudio de la restauración en contextos urbanos ha de ser convenientemente contextualizado. Casi transcurridas dos décadas del siglo XXI ha de tenerse muy en cuenta la situación global en la que nos encontramos. Se trata de una situación definida, entre otros, por dos grandes condicionantes. En primer lugar, las estadísticas oficiales informan de que actualmente más de la mitad de la población mundial vive en ciudades y que dicha tasa se incrementará hasta el 66% en 2050 (United Nations, 2014). Esta tendencia, mucho más marcada en Europa -82% en 2050- viene a reforzar la idea de que la ciudad es el principal ecosistema de la vida humana. En segundo lugar, los efectos del cambio climático son cada vez más evidentes y tanto la ciudad como la vida en ella han de ser repensadas para mitigar dichos efectos, promover la sostenibilidad y mejorar la calidad de vida

urbana (European Commission, 2015; Frantzeskaki, Borgström, Gorissen, Egermann, y Ehnert, 2017; van den Bosch y Ode Sang, 2017).

Por lo tanto, la propuesta tradicional de la Psicología Ambiental en materia de salud y homeostasis psicológica – el uso restaurador de entornos naturales alejados de la ciudad – ha de ser reconsiderada. Se diferencian dos acercamientos o definiciones básicos en materia de sostenibilidad. Por un lado, los planteamientos menos exigentes la definen como la satisfacción de las necesidades del presente sin comprometer la capacidad de las generaciones futuras de satisfacer las suyas (Brundtland, 1987; p. 41). Por otro, las aproximaciones más ambiciosas defienden que la sostenibilidad solo se alcanzaría al transmitir un nivel igual o superior de capital natural o ecológico⁸ a las futuras generaciones (Greene, Robinson, y Millward, 2018). En cualquier caso, y muy en línea con planteamientos recientes en materia de ocio y turismo sostenible (Dubois y Ceron, 2006; Lin, 2010; McKercher, Prideaux, Cheung, y Law, 2010), la obtención de beneficios restauradores a través del contacto con entornos naturales cuyo acceso se realice a través de desplazamientos motorizados – sobre todo si son largos o en medios de transporte con mucho impacto ambiental – habría de ser reconsiderada. Ésta podría afectar a la capacidad de las generaciones por venir de acceder a esos mismos beneficios debido a las consecuencias del cambio climático, la pérdida de biodiversidad y el agotamiento de los combustibles fósiles. El estudio y la promoción de la restauración psicológica en contextos urbanos se revela por tanto como un reto necesario para fomentar la sostenibilidad e

⁸ Este concepto ha de ser entendido como la suma de los recursos naturales, la biodiversidad y los servicios de los ecosistemas presentes en el planeta tierra (Gardner y Stern, 2002).

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incrementar la calidad de vida de los/as habitantes presentes y futuros/as de este planeta. Es por ello que el desarrollo de esta línea de investigación reviste importancia en términos políticos, económicos y sociales (Romice et al., 2017).

Espacio público, calidad de vida urbana y justicia ambiental

El espacio público en el que se vive, entendido como el espacio de y para todos/as (Valera, 2014), ha sido frecuentemente definido como un factor influyente en la salud. Un ejemplo claro de ello es el trabajo realizado dentro del marco de los determinantes sociales de la salud (WHO, 2008, 2015), que plantean que la calidad y prestaciones del espacio público urbano tienen una incidencia directa en la salud biopsicosocial de las personas. En esta línea, diversos autores han planteado ya que la calidad de los espacios urbanos es un indicador básico de la calidad de vida y el bienestar de las personas que los habitan y utilizan (Cattell, Dines, Gesler, y Curtis, 2008; Jennings, Larson, y Yun, 2016; Villanueva et al., 2015). Así, la provisión de una red de espacios urbanos restauradores de acceso fácil y continuo en las ciudades permitiría incrementar el bienestar psicológico de toda la ciudadanía (Thwaites, Helleur, y Simkins, 2005).

Algunos estudios apuntan a que colectivos desfavorecidos y personas mayores tendrían un menor acceso a la recreación privada y a espacios naturales alejados de los entornos urbanos (Rigolon, 2017; Scopelliti y Giuliani, 2004). A esto ha de sumarse toda la literatura que detalla que los colectivos vulnerables tienden a tener un menor acceso a espacios públicos saludables y/o a vivir próximos a espacios de menor calidad o extensión que otros estratos sociales (Gerrish y Watkins, 2018; Kweon,

Marans, y Yi, 2016; Rigolon, 2016; Watkins y Gerrish, 2018; Watkins, Mincey, Vogt, y Sweeney, 2017).

Esta situación podría conducir a una injusticia ambiental, o, dicho de otra forma, se vulneraría el derecho colectivo a un medio ambiente adecuado (Olaizola y Álvarez de Eulate, 2003), en la medida en la que ciertos colectivos no podrían tener igual acceso a entornos positivos. De hecho, podría incluso llegar a exacerbar las inequidades en materia social y de salud entre los diferentes colectivos sociales (Jennings et al., 2016) y sería incluso más relevante en el sur de Europa, donde los espacios naturales son menos extensos y suelen estar más alejados de los centros urbanos (Kabisch, Strohbach, Haase, y Kronenberg, 2016). Por lo tanto, es necesario asegurar el acceso de toda la población a espacios urbanos que contribuyan a la salud física y psicológica de la ciudadanía.

Por todo lo anterior, el estudio de la restauración psicológica en contextos urbanos podría revelarse como un factor imprescindible para lograr ciudades inclusivas y saludables para todos y todas e igualmente ayudar a afrontar los grandes retos globales en materia de sostenibilidad y cambio climático.

0.3 –La vinculación psicológica personas-espacios

Ninguna conducta ocurre en el vacío, y la literatura de Psicología Ambiental y disciplinas afines acierta al señalar que las personas establecemos vínculos psicológicos con los lugares en los que suceden nuestras vidas. Dentro de esta literatura destacan los conceptos de apego al lugar e identificación con el lugar.

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El primero de ellos ha sido definido como un vínculo emocional que mantienen las personas con determinados espacios⁹ (Hidalgo y Hernández, 2001; Low y Altman, 1992). Este vínculo, dinámico y a la vez relativamente estable (Korpela, Ylén, Tyrväinen, y Silvennoinen, 2009), se traduce a nivel conductual en el mantenimiento de proximidad a dicho lugar y en el paso de tiempo en el mismo (Hernández, Hidalgo, Salazar-Laplace, y Hess, 2007). Al igual que el apego interpersonal, se ha descrito que los lugares significativos sirven de base para la interacción y la exploración, otorgan sensaciones de confort y seguridad y pueden ser utilizados como refugio ante situaciones estresantes (Scannell y Gifford, 2014). En un trabajo cualitativo, Scannell y Gifford (2017b) mostraron que el apego a lugares significativos proveía a las personas participantes con diversidad de experiencias positivas. La más referida fue la evocación de recuerdos y la conexión pasado-presente-futuro (también definida como continuidad del self en Lewicka, 2011b y Scannell y Gifford, 2010). Otras experiencias frecuentemente reportadas fueron los sentimientos de pertenencia, la relajación y la práctica de actividades positivas. En otro trabajo, estos autores mostraron que la visualización de lugares de apego incrementaba el afecto positivo y contribuía positivamente a las necesidades personales de pertenencia, autoestima, significado y control (Scannell y Gifford, 2017a).

La otra cara de lo expuesto en el párrafo anterior se encontraría en los efectos perjudiciales que genera la ruptura o disrupción de este vínculo

⁹ A pesar de que el apego al lugar se ha definido y abordado también a nivel grupal o colectivo (Lewicka, 2011b; Scannell y Gifford, 2010), en este trabajo se utilizarán solamente acercamientos y medidas de carácter individual.

(Bernardo y Palma, 2005; Brown y Perkins, 1992). Cuando se producen alteraciones en las características socio-físicas del lugar, este vínculo puede fortalecerse o debilitarse en función de la naturaleza de estos cambios y de la interpretación que de ellos se haga (von Wirth, Grêt-Regamey, Moser, y Stauffacher, 2016). Así, la aceptación u oposición a grandes infraestructuras puede bascular también sobre el apego y los significados de los lugares en los que se realicen (Devine-Wright, 2011; Devine-Wright y Howes, 2010). La alteración de dicho vínculo puede asimismo producirse por relocalizaciones de los individuos debido a guerras, conflictos políticos o sociales, desastres naturales o procesos migratorios. En este último caso, a pesar de planteamientos discrepantes o renovadores (Lewicka, 2011a, 2013; Masso, Vidal, y Pol, 2008), los cambios migratorios ya sean voluntarios o forzados han sido asociados a problemas de integración, desarraigo y malestar psicológico (San Juan, Vergara, y Ocáriz, 2005) debido, en parte, al truncamiento de la relación con los lugares objeto de apego (Gustafson, 2001; Main, 2013; Sampson y Gifford, 2010).

La identificación con el lugar fue inicialmente definida como un constructo multidimensional que recogía las dimensiones del self que definían la identidad personal en relación con el entorno físico (Proshansky 1978). Dentro del mismo se aglutinarían ideas, creencias, preferencias, sentimientos, valores y conductas asociadas a lugares relevantes para los individuos¹⁰. En trabajos posteriores se ha añadido a este concepto la

¹⁰ También se ha trabajado la evidente dimensión social o colectiva de la identificación con los espacios (Bernardo y Palma-Oliveira, 2012; Valera, 1996; Valera y Pol, 1994). Al igual que en el caso del apego, en este trabajo se optará por un acercamiento meramente individual.

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dimensión social, que también generaría contenidos mentales incluidos en este aspecto del self (Fleury-Bahi, Felonneau, y Marchand, 2008; Stedman, 2002). Al igual que cualquier otra identidad personal o social, la identidad espacial o identificación con el lugar sería un medio para distinguirse de otras personas, preservar un sentido de continuidad y fortalecer la autoestima y la percepción de autoeficacia (Lewicka, 2008; Valera, 1996; Valera y Pol, 1994). Por su parte Seamon, (2014), desde posturas más fenomenológicas, define la identificación como el proceso mediante el cual una persona toma un lugar como una parte significativa de su mundo.

Tal y como recogen Hernández, Hidalgo y Ruiz (2014) el estudio de los vínculos personas-lugares se ha visto influenciado negativamente por la gran cantidad de conceptualizaciones, propuestas teóricas, marcos taxonómicos y operacionalizaciones. Esta visión está hoy en día ampliamente respaldada por otros muchos/as autores/as (Devine-Wright y Clayton, 2010; Droseltis y Vignoles, 2010; Lewicka, 2008, 2011b; Scannell y Gifford, 2010). En dicho trabajo los autores organizan las diferentes conceptualizaciones en tres grandes grupos: 1) estudios que entienden que el apego y la identificación son constructos unidimensionales del mismo nivel, 2) aquellos que los consideran como constructos multidimensionales y, 3) los que entienden que uno o ambos constructos forman parte de constructos supra-ordinados (p.ej. sentido del lugar) o que engloban a uno dentro del otro (p.ej. identificación como componente del apego). Sin embargo, muchos trabajos empíricos parten de la consideración de que, aunque relacionados, se trata de constructos diferentes que han de ser medidos y abordados diferencialmente (Casakin, Hernández, y Ruiz, 2015; Hernández et al., 2007; Lewicka, 2008; Rollero, 2013; Ruiz, Hernández, y Hidalgo, 2011; Vidal,

Berroeta, Masso, Valera, y Perú, 2013; Vidal, Valera, y Perú, 2010). Asimismo, este consenso se extiende a la comprensión general de que, si bien ambas variables englobarían aspectos cognitivos, afectivos y conductuales, en el apego al lugar es un vínculo de marcado carácter emocional mientras que la identificación destaca principalmente por su amplio contenido cognitivo.

Dado que el objetivo de este trabajo no es la profundización en las diferencias conceptuales y la interrelación entre el apego y la identificación con el espacio, se optará por continuar en la línea de los trabajos anteriores y tratar a cada constructo de forma diferenciada, aun reconociendo la estrecha relación que pudiera haber entre ellos. En definitiva, estas variables informarían sobre la relevancia personal que determinados lugares podrían tener para las personas que los utilizan y desde esta óptica se ha planteado su uso en este trabajo de investigación.

0.4 Relaciones entre la restauración psicológica y los vínculos personas-lugares

Una vez que los dos pilares principales del edificio teórico de este trabajo han sido presentados, la siguiente pregunta viene ya dada: ¿cómo se relacionan la restauración psicológica y los vínculos personas-lugares? Como primera tentativa de respuesta podríamos citar al profesor Hartig cuando dice que “la experiencia restauradora, el apego al lugar y la identificación con el lugar se influyen recíprocamente” (Hartig, 2004: 277). A continuación, se expondrá una respuesta más elaborada atendiendo a dos enfoques distintos y posiblemente complementarios.

En primer lugar, encontramos los trabajos del profesor Korpela y sus colaboradores/as. Este autor ha dedicado un importante esfuerzo a estudiar

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el uso de los lugares favoritos como estrategia para la regulación psicológica. A través del análisis de entrevistas y ensayos, confirmó que niños/as (Korpela, Kyttä, y Hartig, 2002), adolescentes (Korpela, 1989; 1992) y adultos/as jóvenes (Korpela, Hartig, Kaiser, y Fuhrer, 2001) acudían, en ocasiones, a sus lugares favoritos como una forma de aliviar el estrés y el malestar emocional. A lo largo de estos trabajos acuñó la Hipótesis de autorregulación ambiental¹¹, la cual describe un proceso en el que restauración psicológica y vinculación aparecen íntimamente relacionados. Según esta hipótesis, los beneficios restauradores que algunos lugares otorgarían a las personas que acuden a ellos en estado de fatiga atencional o malestar psicológico reforzarían dicha estrategia de afrontamiento, que por tanto se repetiría en el tiempo. Posteriormente, experiencias restauradoras consecutivas facilitarían el desarrollo del apego y la identificación con el lugar. Según esta hipótesis, los lugares restauradores permitirían maximizar el equilibrio dolor/placer del individuo, mantener un nivel adecuado de autoestima y facilitar las relaciones con otras personas significativas. En palabras del autor, el apego se formaría hacia lugares que cubrieran las necesidades emocionales de las personas y les permitiesen mantener y desarrollar sus identidades (Korpela, 2012). Esta lógica de construcción del vínculo a través, en parte, de la vivencia de experiencias restauradoras es la que se ha utilizado en algunos de los trabajos citados en el apartado anterior que estudiaban los procesos de vinculación con nuevos lugares en población inmigrante (Main, 2013; Sampson y Gifford, 2010).

¹¹ Para trabajos más recientes en esta línea, véanse (Korpela et al., 2018; Korpela, Ylén, Tyrväinen, y Silvennoinen, 2010; Korpela y Ylén, 2009).

En contraposición a este enfoque de carácter desarrollista o historicista, se encuentran trabajos recientes que miran la relación restauración-vinculación desde otra perspectiva. Se ha afirmado que los beneficios psicológicos del contacto con la naturaleza serían explicados, además de por los mecanismos planteados por la ART y la SRT, por la conexión psicológica con la naturaleza.

Bratman y colaboradores/as (2012) plantean que el sentimiento de pertenencia y conexión con la naturaleza – algo más grande que uno/a mismo/a – tendría efectos positivos en el bienestar, tal y como la Psicología Social ha mostrado en el caso de la pertenencia a un determinado grupo. Esta idea es la que parece guiar algunos trabajos recientes en los que se ha estudiado el papel de la identificación con el lugar o con una determinada categoría espacial en la obtención de beneficios restauradores. Un trabajo encontró que la saliencia de la identificación con la naturaleza aumentaba el efecto psicológico de la exposición a la misma, en materia de incremento de motivaciones intrínsecas sobre extrínsecas (Morton, van der Bles, y Haslam, 2017). En ese mismo estudio, la coincidencia de la identificación con lo urbano y la exposición a fotografías urbanas llevó a un mejor desempeño en una tarea de memoria. Otro estudio comparó las tasas de restauración obtenida por una muestra de ateos y cristianos que visitaban un recinto catedralicio inglés (Ysseldyk, Haslam, y Morton, 2016). Se les pidió que centraran su atención en la catedral y su entorno o en sus propios pensamientos. Se registraron mayores cotas de autoestima post-contemplación para los/as participantes cristianos/as cuando contemplaban la catedral y los/as ateos/as pensaban en sí mismos/as. El efecto contrario

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fue observado cuando se producía un desajuste entre la identidad religiosa y el foco de atención solicitado.

En la misma línea, otros trabajos han encontrado que las personas con identidad o preferencia ambiental urbana asignaban a escenarios urbanos un nivel de restauración comparable al de los escenarios naturales utilizados (Wilkie & Clements, 2018; Wilkie & Clouston, 2015; Wilkie & Stavridou, 2013), indicando que el ajuste identidad-lugar incrementaba su potencial restaurador (en contraposición con la valoración de las personas más identificadas con la naturaleza). En el caso del apego, dos estudios desarrollados por Ratcliffe y Korpela (2016, 2017) han mostrado que el apego a los lugares favoritos y los recuerdos en dichos lugares influyen en la percepción de su potencial restaurador.

En uno de los trabajos anteriores (Ratcliffe y Korpela, 2016) se plantea que la investigación acerca de los lugares restauradores ha estado centrada mayoritariamente en los procesos *bottom-up*, es decir, en la influencia de los entornos y sus componentes en la experiencia psicológica de las personas. Sin embargo, el estudio de los procesos *top-down* apenas ha sido abordado. Ratcliffe y Korpela invitan a tener en cuenta la posible influencia de factores personales en la experiencia de restauración y, tal y como ellos ejemplifican, el apego al lugar puede ser una variable relevante a tener en cuenta.

En definitiva, esta nueva tendencia¹² en los estudios de restauración-vinculación no se centra en la construcción del vínculo psicológico a través

¹² Además de diferencias en la forma de entender o estudiar las relaciones restauración-vinculación, en algunos de estos nuevos estudios – a diferencia de los

de las experiencias de restauración, sino en la influencia de dicha vinculación en la obtención de beneficios restauradores. En cierta medida se parte de la premisa de que, a mayor relevancia personal de un determinado lugar, mayor significado de la experiencia de contacto con el mismo y por tanto mayor experiencia restauradora. En este sentido podríamos citar a Ruiz y colaboradores cuando escriben que la percepción de un lugar, pudiendo estar muy influida por el vínculo emocional, es en ocasiones más relevante que las condiciones objetivas del mismo (Ruiz, Pérez, y Hernández, 2013). En esta misma línea, estudios realizados por Knez y colaboradores encontraron sistemáticamente una fuerte relación entre la identificación con un lugar¹³ y el bienestar emocional experimentado en el mismo (Knez et al., 2018; Knez y Eliasson, 2017; Knez, Sang, Gunnarsson, y Hedblom, 2018), siendo la primera predictora del segundo con tasas importantes de varianza explicada (35%). Esto llevó a los autores a afirmar – en cierta forma de acuerdo con Bratman et al. (2012) – que los beneficios psicológicos del contacto con espacios naturales se explicaban en parte por los mecanismos de vinculación psicológica personas-lugares. Éste es el planteamiento general que va a guiar el trabajo realizado en la tesis que aquí se presenta, el cuál será más evidente en el segundo bloque de este documento.

De todas formas, el hecho de que los trabajos comentados en este apartado informen de una remarcable relación entre la experiencia de

estudios referidos anteriormente – se ha recurrido a la operacionalización cuantitativa del apego y la identificación a través de escalas tipo Likert posiblemente no disponibles anteriormente.

¹³ Esta medida combinaba ítems referentes a componentes cognitivos y afectivos de la identificación con el mismo tal y como han sido presentados en este texto.

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restauración y la vinculación psicológica, no quiere decir que la experiencia de restauración sea el único proceso facilitador o constructor de la vinculación con un espacio. Tampoco que sólo pueda producirse restauración en lugares hacia los que el individuo sienta una conexión psicológica en términos de apego e identificación. Este vínculo también podría formarse por ejemplo a través de la experiencia de vivencias personales, la asociación de lugares a personas o grupos significativos o el uso cotidiano de los mismos, independientemente de su posible potencial restaurador. La figura 0.1 muestra cuatro situaciones posibles al cruzar la vinculación con el espacio en abscisas y el potencial restaurador en ordenadas.

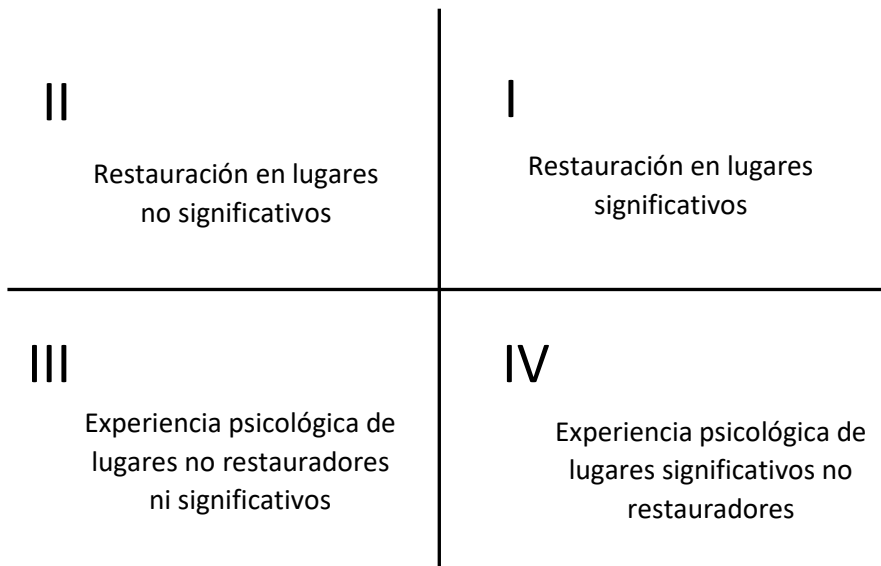


Figura 0.1. Posibles experiencias psicológicas resultantes de la combinación de diferentes niveles de potencial restaurador y vinculación hacia los lugares.

Por tanto, podríamos encontrar un total de cuatro supuestos:

- I. La experiencia de restauración en lugares hacia los que la persona en cuestión se sienta vinculada psicológicamente. Ejemplo de ello sería la recuperación psicológica experimentada en el domicilio personal, el parque favorito o un rincón específico de la ciudad en el que la persona ha vivido experiencias significativas.
- II. La obtención de beneficios restauradores en un lugar hacia el que no existen vínculos de corte afectivo y/o identitario. Éste sería el caso de la restauración psicológica experimentada al hacer turismo o visitar lugares en los que no se ha estado previamente y que posean cualidades restauradoras.
- III. La experiencia psicológica de lugares de escaso potencial restaurador y que no son relevantes en términos de apego e identificación para la persona en cuestión. Los no-lugares (Augé, 1992) - aeropuertos, salas de espera, centros comerciales por citar algunos - bien podrían ejemplificar esta posibilidad.
- IV. La última situación sería la resultante de la visita o uso de lugares hacia los que la persona ha desarrollado un vínculo afectivo y/o identitario pero de reducidas propiedades restauradoras. La oficina de trabajo o el centro de estudios podrían responder a este perfil. De igual forma, no ha de olvidarse que los lugares objeto de vinculación psicológica ofrecen una serie de beneficios más allá de los límites de la restauración (véanse por ejemplo Scannell y Gifford, 2017a, 2017b).

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En la línea de lo explicitado anteriormente (pág. 35), el trabajo realizado dentro del marco de esta tesis doctoral se centra en el primero de los cuadrantes.

0.5 –Objetivos y estructura de la tesis

La tesis doctoral que aquí se presenta persigue dos objetivos principales. En primer lugar, pretende estudiar el fenómeno de la restauración psicológica en ambientes urbanos superando, en la medida de lo posible, la tradicional dicotomía naturaleza-ciudad. Más concretamente, trata de recoger evidencia empírica acerca del potencial restaurador de aquellos espacios urbanos que pudieran proveer a sus usuarios/as de los beneficios psicológicos descritos en la literatura sobre restauración. En segundo lugar, quiere analizar el papel de la vinculación psicológica con los espacios urbanos en la obtención de dichos beneficios.

En este punto conviene matizar que esta tesis no persigue analizar qué visión de las relaciones vinculación-restauración (véanse páginas 30-35) es más válida o cuál es el papel específico de las experiencias de restauración en el establecimiento de vínculos psicológicos con los lugares.

La estructura que presenta es la siguiente. El primer bloque comienza con una revisión sistemática de estudios experimentales o cuasi-experimentales de campo pretest-posttest (capítulo 1). Este trabajo sirvió para recopilar e integrar de forma narrativa la metodología de dichos estudios (muestras, instrumentos, procedimientos...) y sus principales resultados. Además de lo anterior, se evaluaron los estudios incluidos a través de dos herramientas de análisis que permitieron detectar los puntos fuertes y débiles de la investigación en restauración que se ha realizado hasta

la fecha con dicha modalidad de estudio. Asimismo, esta tarea resultó en una serie de recomendaciones para los estudios venideros y que han tratado de integrarse en el resto de estudios comprendidos en este trabajo.

A continuación, se han incluido tres estudios cuasi-experimentales de campo de medidas pretest y posttest, a razón de estudio por capítulo (capítulos 2-4). A nivel metodológico todos comparten una misma estructura, ya que se trata de estudios intersujetos en los que se ha evaluado la restauración obtenida a través de diferentes actividades en espacios distintos. En el primero de ellos una muestra de alumnado universitario, dividida en pequeños grupos, visitó una de dos plazas urbanas por un total de treinta minutos durante los cuales paseó y contempló el lugar. En el segundo, sendos grupos de adultos de mediana edad realizaron una de dos marchas de Nordic Walking; una por el centro de la ciudad y otra a lo largo de las tres playas incluidas en el término municipal de la ciudad. Por último, el tercero de los estudios analizó la restauración obtenida por dos grupos de personas mayores gracias a la práctica de dos actividades al aire libre, Taichi-Yoga y Gimnasia-Zumba¹⁴. Las medidas utilizadas en dichos estudios fueron de corte cognitivo-atencional (capítulo 2) y afectivo (capítulos 2, 3 y 4) y permitieron evaluar el efecto psicológico de dichas actividades. Además,

¹⁴ Si bien es cierto que el capítulo dos está completamente alineado con el primer objetivo de esta tesis, los estudios presentados en los capítulos 3 y 4 se realizaron como consecuencia de algunas de las lecciones extraídas de la revisión sistemática y con objeto de añadir nuevas actividades al set de conductas usualmente evaluadas en los estudios pretest-posttest de campo. A pesar de que los escenarios experimentales utilizados son principalmente naturales se han incluido en el primer bloque al compartir una naturaleza y metodología similar a los estudios incluidos en la revisión sistemática y en el capítulo 2 de este trabajo.

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cada capítulo presenta una discusión pormenorizada de los resultados obtenidos.

Si bien el primer bloque se ha destinado mayoritariamente al primero de los objetivos de la tesis, el segundo se ha dedicado a la valoración del papel de la vinculación psicológica con los espacios en la obtención de beneficios restauradores¹⁵. El capítulo 5 recoge un primer estudio piloto de adaptación de dos instrumentos ampliamente utilizados en esta tesis, la Restoration Outcome Scale y la Escala de Apego e Identificación. Además de lo anterior, en este capítulo se realiza un primer análisis de las relaciones entre la vinculación psicológica y la restauración en contextos urbanos. El capítulo 6 muestra un estudio experimental sobre percepción de restauración realizado con muestra universitaria de la Universidad del País Vasco UPV/EHU y la Universidad de Chile. En él, las personas participantes hubieron de evaluar el potencial restaurador de cuatro paisajes distintos para los cuáles se tomaron también medidas de vinculación psicológica. El último capítulo de este bloque, el número 7, presenta un estudio de en el que se entrevistó a una muestra de usuarios/as regulares de plazas de la ciudad de Donostia con el fin de analizar la vivencia de experiencias restauradoras en ellas y la vinculación psicológica con las mismas.

Fuera de ambos bloques encontramos por último el capítulo 8, que sintetiza los resultados obtenidos en cada uno de los bloques y plantea interpretaciones, comentarios e hipótesis que traten de explicar lo encontrado. Para finalizar, se recopilan todos los resultados de este trabajo

¹⁵ Parte de los análisis realizados en el capítulo 4 también corresponden al segundo de los objetivos de este trabajo (véase sección 4.3.4, pág. 135).

de investigación utilizando como base el Modelo de Personas-Lugares-Procesos de Scannel y Gifford (2010).

Finalmente se añade el Anexo I que describe el proceso de desarrollo de una herramienta para la evaluación objetiva del potencial restaurador de espacios urbanos por parte de jueces/as expertos/as. Recoge además evidencia preliminar sobre la fiabilidad y la validez del instrumento. El Anexo II presenta la forma actual de dicha herramienta.

CAPÍTULO 0

Tabla 0.1.

Objetivos de los estudios presentados en los dos bloques de la tesis doctoral

Bloque	Capítulo- estudio	Objetivos
	1	<ul style="list-style-type: none">▪ Reunir la evidencia disponible acerca de la restauración psicológica obtenida a través de estudios pretest-posttest de campo▪ Analizar las características de la investigación realizada hasta la fecha en dichas área y modalidad▪ Proponer recomendaciones para futuros estudios en esta área
Bloque 1	2	<ul style="list-style-type: none">▪ Analizar el potencial restaurador de dos plazas urbanas
<i>Estudios pretest- posttest</i>	3	<ul style="list-style-type: none">▪ Analizar el potencial restaurador de la marcha nórdica
	4	<ul style="list-style-type: none">▪ Analizar el potencial restaurador de dos actividades grupales al aire libre: Taichi-Yoga y Gimnasia-Zumba▪ Explorar la relación entre la vinculación con el lugar y los beneficios restauradores de la actividad

Bloque	Capítulo- estudio	Objetivos específicos
<p>Bloque 2</p> <p><i>Relaciones vínculos- restauración</i></p>	<p>5</p>	<ul style="list-style-type: none"> ▪ Adaptar la Restoration Outcome Scale al castellano ▪ Adaptar la Escala de Apego e Identificación para su uso en espacios urbanos específicos ▪ Ratificar que ambas adaptaciones muestran una adecuada fiabilidad ▪ Realizar un estudio preliminar de la relación entre la vinculación psicológica y la restauración en espacios urbanos abiertos
	<p>6</p>	<ul style="list-style-type: none"> ▪ Explorar el papel del apego y la identificación con el lugar en la preferencia paisajística y la evaluación del potencial restaurador de los paisajes naturales y urbanos
	<p>7</p>	<ul style="list-style-type: none"> ▪ Analizar la influencia de variables físicas y de diseño, demográficas, de las rutinas de uso y de variables psicológicas en la restauración psicológica experimentada en plazas urbanas.

**BLOCK 1 PRETEST-POSTTEST FIELD
STUDIES ON PSYCHOLOGICAL
RESTORATION**



CHAPTER 1
**ANALYTIC AND DESCRIPTIVE REVIEW OF PRETEST-
POSTTEST FIELD STUDIES ON RESTORATION**

The content of this chapter has been published in Subiza-Pérez, M., Vozmediano, L., & San Juan, C. (2018). Pretest-posttest field studies on psychological restoration: a descriptive review and reflections for the future. *Landscape Research*, 0(0)¹⁶, 1–13. <https://doi.org/10.1080/01426397.2018.1493443>

¹⁶ To be published in 2019.

1. 1. Introduction

A large amount of evidence about restoration has been gathered after four decades of research in the areas of Environmental Psychology, Public Health, Sport and Leisure, Urban Planning, Geography and Medicine among others. Particularly pretest-posttest field studies have offered evidence on the restorative processes. The purpose of this work is to review exiting evidence in order to inform future research on the topic.

1.1.1 What is restoration?

An integrative definition describes restoration as the renewal of physical, psychological, and/or social resources diminished in ongoing efforts to meet everyday demands (Hartig, 2004). Therefore, a restorative environment provides this renewal of resources to people visiting, using or spending time in it. This construct is based on two theories of human-nature interaction; the Attention Restoration Theory (Kaplan & Kaplan, 1989) and the Stress Recovery Theory (Ulrich, 1981; Ulrich et al., 1991). From a psycho-evolutionary perspective, both claim that natural environments can help to recover from attentional fatigue and emotional distress. However, they do it drawing upon distinct theoretical explanations (for a schematic summary of commonalities and differences, see Figure 1.1).

Stress Recovery Theory (SRT)

Stress Response takes place when individuals face events or situations that might threaten well-being and/or survival and provides them with the suitable psycho-physiological energy and resources to meet the situation's demands. After such endeavour, even in the case of avoiding or solving the perceived threat, stress, anxiety and other negative affective outcomes may

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be experienced. Emotional fatigue or distress, due to the depletion of psycho-physiological energy, will be accompanied of a reduction in task performance (Ulrich et al., 1991).

Exposure to outdoor environments might foster or hinder the recovery from the aforementioned state (Ulrich et al., 1991). The author describes the restorative environment as having great natural content, openness, a moderate level of complexity and being safe and no demanding. These features would have important implications for human survival and well-being, in the short (individual experience) and long term (species' evolution), and elicit fast positive affective responses that will allow the person to overcome depletion (Ulrich, 1993).

Attention Restoration Theory (ART)

Kaplan & Kaplan (1989) presented this theory drawing a cognitive-centred explanation of restoration. People use their cognitive executive abilities (directed attention, attention inhibition, information processing, decision taking...) in their daily tasks, usually when working, and this requires psychological energy, which is not unlimited. Sustaining these cognitive efforts might lead to an attentional fatigue state, characterized by impaired task performance, frustration and irritability.

Following the Kaplans, restorative environments are places where people experience psychological distance from daily context, feel away from every day's worries, thoughts and goals (*being away*), perceive a rich, complex and well-organized content (*extent*), experience aesthetic pleasure and interest (*fascination*) and feel that their needs and inclinations are fulfilled (*compatibility*). Thus, the restoration process will begin and go

through four consecutive stages; clearing the mind of cognitive residuals from previous tasks, direct attention recovering, focusing on unheard contents and finally, reflecting about one's life, objectives and priorities. These stages can be grouped in two broader categories; *attention restoration* (1.& 2.) and *reflection* (3.& 4.; Herzog, Black, Fountaine, & Knotts, 1997) and will be achieved according to the specific restorative potential of each environment and the nature of the exposition to it (e.g. length and activities).

1.1.2 State of the Art

Theoretically speaking, both perspectives differ in key elements and their statements might enter in clear conflict as pointed out by Ulrich and Kaplan themselves. Ulrich demanded that attentional fatigue is one of the outcomes of stress state, denying the central role of cognitive conscious and rational processes (Ulrich et al., 1991). In later writings, he included the restoration phenomenon in the biophilia-biophobia framework, emphasizing again its affective nature (Ulrich, 1993). Kaplan's answer was an attempt to overcome the theoretical conflict and set up an integrative and synthesised vision of restoration, including the main points of each perspective (Kaplan, 1995). His proposal was to go towards a more open understanding of stress response, where an individual's actual cognitive resources in a stressful situation define the quality and dimension of the subsequent response. While both authors continued keeping their original positions, a quick look at the research conducted thereafter reveals that both attentional and affective measures have been used when addressing restoration in pretest-posttest field studies.

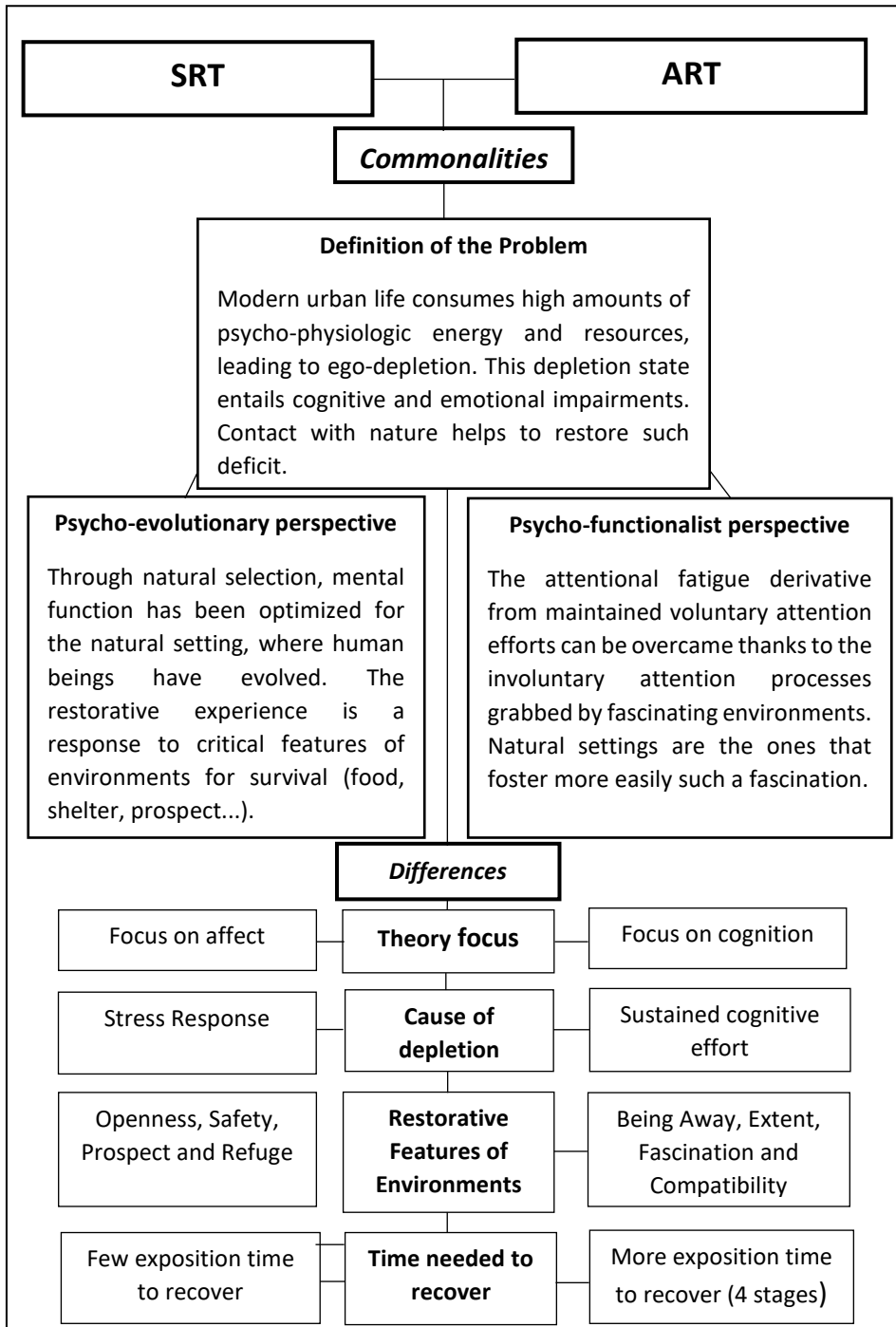


Figure 1.1 Graphic comparison between SRT and ART

Nowadays restoration is profusely studied in Environmental Psychology using a wide range of methodologies. Experimental or quasi-experimental laboratory (Berto, 2005; van den Berg, Koole, & van der Wulp, 2003) and field (Hartig, Evans, Jamner, Davis, & Gärling, 2003; Roe & Aspinall, 2011; Tyrväinen et al., 2014) studies have been conducted. Recently, survey methods have been also used (Korpela, Ylén, Tyrväinen, & Silvennoinen, 2008, 2010); increasing the range and scope of research in this area.

Pretest-posttest studies might be the most suitable ones to measure the restorative process, as they allow comparing the psychological state of participants before and after visiting the experimental setting. Therefore, we understand that the difference between such scores is the actual restorative effect of the experience. Moreover, pretest-posttest field studies provide increased ecological validity, an important issue regarding the accuracy and usefulness of scientific research in this topic. Therefore, we chose to focus in this kind of studies to carry out a literature review.

1.1.3 Study Aim

The review presented in this paper has three objectives: 1) to gather the available evidence about restoration, focusing specifically on pretest-posttest field studies, 2) to analyze the nature of the research conducted to date and 3) to propose recommendations to meet the future challenges of this area of research.

1.2. Method

1.2.1 Search Strategy

Three inclusion criteria were established:

1. Experimental or quasi-experimental field studies where subjects were assigned to a real setting or settings.
2. Studies taking pretest and posttest measures of psychological and/or physiological variables.
3. Studies with samples composed by normal population (not having severe mental or physical disorders).

Bibliographic search was conducted in May 2015 in three Databases; Web of Knowledge, SCOPUS and Psycinfo using the following as keywords; Attention Restoration Theory, Stress Recovery Theory, Stress, Field Study, Restoration, Natural, Urban, and Restorative Environment. Boolean operators such as “and” and “or” were used. A great amount of articles was obtained and then refined within the areas of Social Sciences and Health (Psychology, Medicine, Leisure and Sport.). After refining, an initial database containing 1381 references was built. Duplicates’ elimination and abstract reading reduced the number to 289 articles. Applying the criteria exposed before, the final sample consisted of 19 studies.

1.2.2 Article analysis

Basic information (sample, measures, settings and environmental intervention) was extracted from the articles, and then they were assessed using two different tools; the Quality Assessment Tool for Quantitative

Studies (EPHPP 2009a, b) and another tool designed *ad hoc* for this review. The Quality Assessment Tool for Quantitative Studies (QATQS) allows to extract information about the study design, the selection of the subjects, the methods for data collection, the confounders, the blinding strategies if used and the information given about withdrawals. Then, these domains are rated to evaluate the quality of the study. This tool has been used in other systematic reviews (Grasser, Van Dyck, Titze, & Stronegger, 2013; Larouche, Saunders, Faulkner, Colley, & Tremblay, 2014).

The second tool is an evaluation checklist designed by the authors of the paper, as a way of reflecting about some of the frequent limitations perceived by them in this area of research, attending to design and report issues. It is divided in five main dimensions; description of settings, description of environmental treatment, nature of environmental treatment, psychological state of subjects in sample and report of results. Better ratings indicate that the analysed study is more accurate to get evidence about restoration and that the reported results are more useful to scientific community. Additionally, we think the tool may be used as a guide for researchers when facing the design and report of their restoration field studies. Description of the tool, *The Environmental Psychologist Checklist for Pretest-posttest Restoration Field Studies*, including the rating criteria, can be found in Table 1.1.

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Table 1.1

The Environmental Psychologist Checklist for Restoration Pretest-Posttest Field Studies

Domain	Rating (points)	Description
Description of setting/s	<i>Excellent</i>	The setting/s is/are fully described, paying attention to physical (green availability, landscape, land use...) and social aspects (number of people, activities...).
	<i>Good</i>	A reasonable amount of information about physical and/or social aspects of the setting/s is given about but some important data is missing.
	<i>Fair</i>	Very little information is given about the setting/s used.
	<i>Missing</i>	The setting/s is/are not described at all.
Description of Environmental Treatment	<i>Excellent</i>	Activities performed by participants are fully described, mentioning the nature of the activity (walking, running, individually, in group...), the duration, the distance and additional data.
	<i>Good</i>	A reasonable amount of information is given about the activities performed but some important data is missing.
	<i>Fair</i>	Very little information is given about the activities performed by participants.
	<i>Missing</i>	The activities performed by participants are not described at all.
Nature of Environmental Treatment	<i>Ecological</i>	The activities performed by participants are very similar or close to the usual behaviour of people in open public places.
	<i>Non-ecological</i>	The activities performed by participants are different or distant from the usual performance of people in open public places.

REVIEW OF PRETEST-POSTTEST FIELD STUDIES

Domain	Rating (points)	Description
Psychological State of Participants (pre)	<i>Excellent</i>	In the moment of receiving the ET, participants are fatigued/ stressed due to their daily activities (studying, working, attending classes...).
	<i>Good</i>	In the moment of receiving the ET, participants are fatigued/stressed due to their daily activities (studying, working, attending classes...) and to tasks set by the researchers in the design of the study.
	<i>Fair</i>	In the moment of receiving the ET, participants are fatigued/ stressed due to tasks set by the researchers in the design of the study.
	<i>Missing</i>	Participants are not fatigued/ stressed at all or information about it is missing.
Report of results	<i>Good</i>	Pretest, posttest and effect size scores for each variable measured are displayed or can be calculated using the data showed in the paper.
	<i>Missing</i>	Pretest, posttest and effect size scores for each variable measured are not displayed and/or cannot be easily calculated using the data showed in the paper.

1.3. Results

1.3.1 Descriptive analysis of studies

All selected studies were published in English, although they were conducted in several countries [Canada (1), Finland (1), Japan (6), Sweden (1), Switzerland (1), UK (3) and USA (5)]. Main results of their descriptive analysis are displayed below, grouped in four categories: samples, measures, settings and environmental intervention. The specific information for each study is showed in table 1.2.

Samples

A total of 1,629 people participated in the selected studies; 733 females (45%) and 896 males (55%). Eleven of the studies worked with samples containing members of both genders [1,2,3,5,6,9,10,12,14,18,19] and 8 studies got single-gender samples: 4 female-only [4,8,13,16] and 4 male-only [7,11,15,17]. In most cases, 13 out of 19, the sample was composed by university students [1,2,5,6,7, 8, 11,12,13,15,17,19]. The size of the samples ranged from 11 to 498 people ($M = 81.45$; $SD = 115.59$).

Measures

Pre-post cognitive-attentional, affective and physiological measures were taken in the sample of studies analysed. Eleven studies only used affective measures [4,7,9,10,12,13,14,15]. From the remaining eleven, four comprised cognitive and affective outcomes [2,3,8,19] and another four, affective and physiological [11,16,17,18]. Finally, two studies included measures of the three domains [5,6] and one used EEG and technological devices [1].

The most used instruments for the attentional-cognitive domain were Necker Cube Pattern Control Task [5,6,19], Digit Span Task [2,3] and Symbol Digit Modalities Test [3,8]. For affective assessment, Profile of Mood States [4,11,15,17] and Positive and Negative Affect Schedule [2,16,18] were the most used ones. When measuring physiologic responses, authors usually registered Heart Rate [6,11,17] and salivary cortisol [11,16,18].

Settings

The number of settings used in each field study varied from 1 to 3 ($M = 1.89$; $SD = 0.68$). When having 2 or more settings, green and urban environments were usually selected. Within the natural/green category, forests [9,10,11,15,17,18], parks [2,3,4,5,18] and university campuses [7,12,13,16,19] were the most common option. The urban spaces were often commercial streets with moderate to high presence of people and vehicles [1,2,3,15,17]. Residential, historic and industrial urban settings were scarcely represented [3, 14, 4 respectively].

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Table 1.2.

Studies included in the review

Paper	Sample	Pre-post Measures	Setting/s	Environmental Intervention
1. Aspinall, Mavros, Coyne, & Roe, 2013	12 university students; 4 females and 8 males ($M = 30$ years).	Sophisticated electronic gear; EEG, GPS and laptop	S ₁ Urban shopping street S ₂ Path through green space S ₃ Busy commercial district	24-26' individual walking.
2. Berman, Jonides, & Kaplan, 2008 (Study 1)	38 university students; 23 females and 15 males ($M = 22$ years).	Positive and Negative Affect Schedule (PANAS) Backwards digit span task	S ₁ Urban park S ₂ Heavy traffic street downtown	50-55' individual walking
3. Bodin & Hartig, 2003	12 people; 6 females and 6 males ($M = 39$ years).	Exercise Induced Feeling Inventory (EFI) Negative Mood Scale Digit Span Forward Digit Span Backward Symbol Digit Modalities Test (SDMT)	S ₁ Park route S ₂ Commercial and residential zone	60' individual running (14 km)

REVIEW OF PRETEST-POSTTEST FIELD STUDIES

Paper	Sample	Pre-post Measures	Setting/s	Environmental Intervention
4. Butryn & Furst, 2003	30 female runners (<i>M</i> = 39 years).	Profile of Mood States (POMS) Exercise Induced Feeling Inventory (EFI)	S ₁ Urban park S ₂ Urban industrialized area	4 miles (6,43 km) individual running
5. Gatersleben & Andrews, 2013 (Study 2)	17 university students; 10 females and 7 males (<i>M</i> = 23 years).	Zuckerman's Inventory of Personal Reactions (ZIPERS) Necker Cube Pattern Control Task (NCPCT) Heart rate	S ₁ Urban park route; low prospect high refuge S ₂ Urban park route; high prospect, low refuge	10' individual walking
6. Hartig et al., 2003	112 university students; 50% females (<i>M</i> = 20 years).	Zuckerman's Inventory of Personal Reactions (ZIPERS) Necker Cube Pattern Control Task (NCPCT) Memory-Loaded Search Task Heart rate	S ₁ Nature Reserve S ₂ Medium density urban area	10' individual sitting 50' individual walking

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Paper	Sample	Pre-post Measures	Setting/s	Environmental Intervention
7. Kerr et al., 2006	44 male university students ($M = 22$ years). 12 were competitive and 12 non-competitive runners.	Tension and Effort Stress Inventory (TESI)	S ₁ University Campus	5 km individual running
8. Lethbridge, Yankou, & Andrusyszyn, 2005	16 female university students ($M = 19$ years).	<p>Finding A Test Symbol Digit Modalities Test (SDMT)</p> <p>Attention Function Index (AFI) Visual Analog Mood Scale (VAMS) Quality of Life Index (QLI)</p>	No information available.	60' group walking
9. Martens, Gutscher, & Bauer, 2011	96 people; 44 females and 52 males ($M = 37$ years).	Abele-Brehm Mental State Scale	S ₁ Tended forest area S ₂ Wild forest area	30-40' individual walking
10. Morita et al., 2007	498 people; 254 females and 244 males ($M = 56$ years).	<p>State-Trait Anxiety Inventory (STAI-State Scale)</p> <p>Multiple Mood Scale Short Form (MMS-SF)</p>	S ₁ Forest	Forest visit (140' of stay and 5,7 km tour on average).

REVIEW OF PRETEST-POSTTEST FIELD STUDIES

Paper	Sample	Pre-post Measures	Setting/s	Environmental Intervention
11. Park, Tsunetsugu, Kasetani, Kagawa, & Miyazaki, 2010 (Multiple studies)	280 male university students (<i>M</i> = 21 years).	Profile of Mood States (POMS) Multiple physiological measures	S ₁ Forest (multiple locations) S ₂ City (multiple locations)	14' sitting 16' walking
12. Plante, Cage, Clements, & Stover, 2006 (Condition 1)	112 university students; 65 females and 47 males (18-20 years).	Activation-Deactivation Adjective Checklist (AD-ACL)	S ₁ : University Campus	20' individual walking
13. Plante et al., 2007 (Groups 3 and 4 Experimental Condition 2)	44 female university students (18-21 years).	Activation-Deactivation Adjective Checklist (AD-ACL)	S ₁ : University Campus	20' individual walking (gr.3) 20' walking with friend (gr.4)
14. Roe & Aspinall, 2011 (Studies 1 and 2 ;good mental health groups)	Study 1 83 people; 62 females and 21 males (<i>M</i> = 50 years). Study 2 11 people; 7 females and 4 males (<i>M</i> = 46years).	UWIST Mood Adjective Checklist	Study 1: S ₁ Rural area Study 2: S ₁ Rural area S ₂ Urban area	60' group walking

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Paper	Sample	Pre-post Measures	Setting/s	Environmental Intervention
15. Takayama et al., 2014	45 male university students ($M = 21$ years).	Profile of Mood States (POMS) Positive and Negative Affect Schedule (PANAS)	S ₁ Forest (multiple locations) S ₂ City Centre (multiple locations)	15' individual walking 15' individual sitting
16. Teas, Hurley, Ghumare, & Ogoussan, 2007	19 women ($M = 58$ years).	Positive and Negative Affect Schedule (PANAS) Cortisol and alpha amilase in saliva	S ₁ : University Campus	60' individual walking
17. Tsunetsugu et al., 2013	44 male university students ($M = 21$ years).	Profile of Mood States (POMS) Heart rate Blood Pressure	S ₁ Forest S ₂ Urban area	15 minutes individual sitting
18. Tyrväinen et al., 2014	77 people; 71 females and 6 males ($M = 47$ years).	Positive and Negative Affect Schedule (PANAS) Subjective Vitality Scale (SVS) Cortisol in saliva	S ₁ Urban park S ₂ Forest S ₃ City Centre	15' group sitting 30' group walking

Paper	Sample	Pre-post Measures	Setting/s	Environmental Intervention
19. Weng & Chiang, 2014 (“Walking” group)	39 university students; 22 females and 17 males ($M = 19$ years).	Necker Cube Pattern Control Task (NCPCT) State-Trait Anxiety Inventory (STAI-State Scale)	S ₁ : University Campus	2-3km group walking

Note: Selected studies have been numbered to ease the report of results of this review along the paper. In some cases, under the name of the author/s there is a parenthesis that indicates the specific group or condition that met the inclusion criteria and has been accordingly analyzed.

Environmental Interventions

Environmental interventions lasted between 10 and 140 minutes ($M = 44.18$; $SD = 30.59$). Several activities were performed by subjects during the experiments; individual walking [1,2,5,9,12,13,16], group walking [8,13,14,19], individual running [3,4,7] and static contemplation of landscape [17]. Other 4 studies made a combination of static contemplation and walking [6,11,15,18]. The intervention of one study [10] was not enough described so it has not been included in any of the previous categories.

1.3.2 Quality evaluation

Quality Assessment Tool for Qualitative Studies

The main fortitudes of the sample of studies selected are related to Data Collection and Withdrawals. All the studies used reliable and valid previously developed instruments and, when having experimental mortality, it was very little and accurately reported. The main weakness was related to the sample

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composition. All the studies got samples of self-referred (voluntary) subjects, threatening representativeness. This fact leads to a *Weak Score* in the Selection Bias domain of the QATQS, preventing any study to get a *Strong Global Score*.

Studies could not be ranked according to the three levels of confounder's control that the tool proposes. To the knowledge of the authors, nowadays consistent information about potential confounders - variables that could intervene, modify or moderate the obtained restoration - is lacking. Only inter-study variability in the control of some variables that could be significant was noticed. Gender was specifically controlled by design in two studies [3, 15] and had design and statistical control in other one [6].

Randomization was present in several studies. Some within-subjects studies randomized the order of visits to the different settings [3,5,7,11,15,17,18]. In inter-subjects designs, some studies randomized the assignation to experimental conditions [8,9,12,13]. Regardless of the presence of randomization, three studies checked if there were significant differences in dependant variables and other important variables (e.g. sex or age) in pretest [3,6,8].

In relation to the Design domain, all but five studies [2,8,9,13,14] got a "moderate" score. That is due to the general absence of control groups¹⁷. This might be a serious threat to validity because the effects of mere time-

¹⁷Here some debate was held between the authors, because many studies compared natural places with urban ones, or different kinds of naturals. But in its essence, there were not control groups as they were treated as groups receiving another Environmental Treatment.

passing and the activity per se (running, walking or sitting) are therefore not controlled.

The Environmental Psychologist Checklist for Restoration Pretest-posttest Field Studies

Most studies described accurately the environmental intervention given to subjects, referring nature of activities, length and other data. Those interventions were, in all cases, rated as ecological in the way that the activities performed by them were common conducts between the users of natural and public places.

The use of this tool revealed also some weaknesses. Firstly, all studies but 5 [2,5,6,8,18] did not give any information about the psychological state (ego-depletion, stress or attentional fatigue) or need of restoration of subjects at the beginning of the experiment¹⁸. Secondly, information about the physical and social features of settings was absent or scarce in nine of the studies [2,5,8,10,11,12,13,16,19]. For the rest, they were well described in general terms but usually lacking description of social landscape (amount of people, activities, uses...). And finally, a complete report of results was only present in 4 studies [3,5,18,19]. The rest all lacked effect sizes indexes, and sometimes only reported the difference between pretest and posttest but missed the actual scores.

¹⁸Three used cognitive loading tasks to fatigue [2,5,6] them and 2 were conducted after daily performance in work and studies [8,18]. In addition, these studies usually reported the pretest scores for the variables included in the design. Most of the remaining studies only reported the change rates experienced by the participants, not allowing to infer their psychological state prior to the experimental situation.

1.3.3 Integration of results

In this section, the evidence available in the sample of studies will be grouped in the cognitive-attentional, physiological and affective domains in order to get a clearer picture of the evidence for each.

Within the studies that included cognitive-attentional measures, 5 studies reported an increase in performance after receiving the Environmental Intervention in a green setting [2, 5, 6, 8, 19]. Two of these studies also included urban settings [2,6], where no significant changes and performance impairment were observed respectively. The remaining study did not report significant changes in this area attributable to park or urban settings [3].

In the case of the affective domain, decreases of negative emotions (such as depression, tension, sadness, confusion, hostility or stress) were widely documented [9,10, 12, 14,15,16,19] when visiting natural or green places. Similarly, a reasonable amount of studies also reported increases in positive affect [2,9,14,16,18]. However, three studies did not get evidence supporting increases in positive affect and decreases in negative affect due to natural/green exposure [3,4,7], a finding that could rest on the activity performed by participants (running). When in urban settings, affective modifications are inconsistent. Two studies report reductions in positive affect and increases in negative affect [17,18]. One study did not report any significant affective change after urban setting exposition [14], and other only found a decrease in vigor and an increase in fatigue [15], with tension-anxiety, depression and hostility remaining constant.

Physiological measures were taken in 6 studies. Heart rate reduction was detected in green settings in three of them [5,6,11]. Salivary cortisol concentration got reduced in one study [11] and there was no change in other [18]. In study 16 there were not direct and clear references to the possible change in salivary cortisol due to the environmental intervention and in number 17, the results were displayed as a comparison between the two settings used so we could not extract any conclusion on this issue.

1.4. Discussion

This paper presents a descriptive review of 19 restoration pretest-posttest field studies. Its main objectives were to gather the evidence available, to reflect about its weakness and strengths and to point out at the issues that should be addressed now on in this area of research.

In these studies, researchers measured cognitive-attentional, affective and/or physiological variables before, during and after an environmental intervention. The differences between studies (related to activities and settings, research objectives, hypotheses and report of results) make it difficult to get an accurate image of the state of the available evidence, but there is a reasonable amount of evidence supporting the main premises of ART and SRT. Natural/green places can alleviate the negative affective outcomes and the attentional fatigue caused by daily performance. Once both theories have been sufficiently supported it may be time to overcome the debate between them concerning the nature of the restorative process and build a new integrative framework.

Returning to the definition of restoration that opened this paper (Hartig, 2004), it might seem evident that the study of the recovery of social

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resources has been somehow neglected as no study included measures directly related to such domain. However, some publications reporting research in laboratory contexts have recently done so, using measures of prosociality (Joye & Bolderdijk, 2015; Zelenski, Dopko, & Capaldi, 2015). Another ignored issue is the reflection phase of restoration according to ART, where additional work should be done.

Despite the general support given to ART and SRT postulates by the studies here reviewed, the use of two assessment tools revealed some methodological limitations that should be addressed in future studies. All rates in QATQS were moderate or weak because of the absence of control groups and the selection bias, due to having voluntary participants. But we should keep in mind that designers of the tool consider the Randomized Control Trial with representative samples, high control of cofounder variables and blinding of experimenters as the design of maximum quality. Some of these elements are not easily achievable in Environmental and Social Psychology field studies. Besides, it could be that some papers did not report all the aspects of their design in detail, preventing them to obtain a higher score. The use of the second tool, specifically designed to assess aspects of design and information directly related to the restoration topic resulted useful too. It revealed that, generally, studies lacked information about the psychological state of subjects before the Environmental Intervention and that did not report all the desirable statistical information.

Regarding the instruments, it should be noted that studies measured cognitive performance and affective states with a varied group of instruments to quantify the same variables (e.g. anxiety or attention). Following a recommendation from Bringslimark et al., (2009), setting a

standard kit of measures for restoration field studies could facilitate the comparison between studies and the integration of their results. To do so, this paper offers a record of the most commonly used measures of both areas in epigraph 3.1. In relation to the assessment of cognitive-attentional performance, the tools used might not allow to understand the restoration of superior cognitive processes and capacities as it has been indicated recently (Atchley, Strayer, & Atchley, 2012; Bratman, Daily, Levy, & Gross, 2015). This is a challenge that must also be addressed in future studies.

Articles in the sample sometimes provided little information about the settings used. In our view, the study of place design, configuration and dynamics is central in this topic, in order to deepen in the understanding of the natural and urban places that may be restorative. To do so, the description of the settings used should be more detailed in order to, again, facilitate the comparison between studies. It could also facilitate the detection of urban places, not only parks, which could provide citizens with restorative experiences near their homes and work places (Subiza-Pérez, Vozmediano, & San Juan, 2017).

Two considerations are to be done regarding participants. Firstly, most studies worked with university samples; students are easily accessible, have more time availability and are very used to answer tests. However, they do not represent the general population and the use of university samples might entail both age and social class biases. Consequently, the restoration process should continue being studied in other kind of samples. Secondly, as previously mentioned most studies did not report information about the psychological state of subjects before the environmental intervention. This is a key point because one should be ego-depleted, fatigued or stressed in

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order to be restored. In fact, subjects in a worse psychological condition get higher rates of affective restoration (Roe & Aspinall, 2011). Therefore, it should be somehow assured that subjects are in an attentional fatigue or stress state before the intervention. Besides, analyzing restoration as of different levels of fatigue could be another interesting research to be done.

Some reflections should also be done in relation to the restorative qualities of the different settings and activities, and possible biases when selecting the places to conduct research. Researchers have selected natural/green recreational places with high aesthetic value and urban places designed for transportation and with little aesthetic interest (e.g. busy streets, see Karmanov & Hamel, 2008; Staats et al., 2016). Put simply, and maybe oversimplified, restoration perspective conceives nature or green as highly restorative and urban settings as the opposite. This review provides with interesting hints to challenge that point of view. Firstly, two studies showed that nature is not equally restorative: tended forest and natural places high in prospect and low in refuge are more restorative than their counterparts (Gatersleben & Andrews, 2013; Martens et al., 2011). Secondly, as it has been showed in the results' epigraph, the urban settings in the sample of articles (even if not very attractive or restorative at first sight) did not always produce the expected negative cognitive-attentional and affective outcomes in the people visiting them. Speaking about activities, there are some that have demonstrated their restorative potential (contemplation and walking) and other that have not been explored yet (e.g. reading, chatting or playing sports). The case of running is interesting because the three studies involving such activity, due probably to the effort

required, prevented participants to get some of the expected restorative outcomes at post-test time (mainly attention restoration and invigoration).

Some consideration for future studies

To conclude this review a series of recommendations for future *pretest-posttest* field studies in this area will be listed. We propose that future studies will be more valuable and useful for scientific community, practitioners and society if they:

1. Include not only university samples.
2. Check that participants are actually ego-depleted, fatigued or stressed.
3. Use control groups to assess the restorative potential of activities and environments separately.
4. Use instruments to measure the three main domains of cognition-attention, affective state and physiology and agree on a standard kit of measures.
5. Expand the traditional set of measures to include social resources or abilities, or other innovative measures.
6. Study the restorative potential of several activities or environmental interventions.
7. Compare the effects of different doses (length) of environmental interventions.
8. Offer a deeper description and analysis of the experimental settings in terms of their physical and social features.
9. Have designs that allow comparing the level of restorative potential that different natural/green and urban places hold.

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10. Give a more accurate report of results: including pretest and posttest scores, standard deviations and effect sizes that will eventually allow their statistical integration.

We believe that the exposed recommendations, along with this strategy for mapping present and future knowledge will be useful for consolidating and further developing research on restoration.



CHAPTER 2 THE RESTORATIVE POTENTIAL OF URBAN SQUARES

Most of the content of this chapter has been published in San Juan, C., Subiza-Pérez, M., & Vozmediano, L. (2017). Restoration and the City: The Role of Public Urban Squares. *Frontiers in Psychology*, 8, 1–13. <http://doi.org/10.3389/fpsyg.2017.02093>

2.1 Introduction

The potential for reducing negative psychological states or increasing positive ones is a well-established value present in natural landscapes, known as restorative potential. The possible restorative potential of urban landscapes has been less widely studied, since cities have been considered by authors such as Simmel (1984) and Milgram (1970) as being stressful and over-demanding contexts. Even when the urban environment has been studied, attention was focused on green areas within the city (e.g., urban parks, forests, and university campuses). Consequently, our knowledge of the potential role that other public urban places may play is limited, although some evidence supports the idea that urban landscapes may also be restorative. The aim of this paper is to expand existing evidence by assessing the psychological effects of spending time in a specific type of the urban landscape: public squares.

2.1.1 The Psychology of Restoration: Aesthetic Experience and well-being

Landscape preferences have become a relevant field of research for several disciplines within the social sciences, particularly environmental psychology. The lack of “objective” criteria for establishing the quality of a landscape and perceptual strategies for exploring it, as well as the difficulties involved in measuring its impact on the perceiving subject, have given rise to three main areas of research focused on both natural and urban landscape assessment:

- Landscape assessment studies focused on the “objective” attributes of the landscape that can be measured directly, usually by expert observers (Otero, Casermeiro, Ezquerro, & Esparcia, 2007; Prato, 2000; Schirpke, Tasser, & Tappeiner, 2013; Vizzari, 2011).

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- Landscape preference studies focused on the perceptions of everyday users of the landscape (i.e., non-expert individuals) and concerns about the “nature” of those users’ assessments (Hull & Stewart, 1995; Hunziker et al., 2008; Roth, 2006; Yamashita, 2002).
- Studies on the landscape’s restorative qualities, focused on the potential impact of interactions between landscape and users (Finlay, Franke, McKay, & Sims-Gould, 2015; Korpela, 2013; Lee, Park, Tsunetsugu, Kagawa, & Miyazaki, 2009; Milligan & Bingley, 2007; Pazhouhanfar & Kamal, 2014).

The aforementioned research areas are, in fact, steps in a process that commences when a subject first comes into contact with a context that can be perceived; a context that, according to some objective characteristics, attracts his/her attention. Because of previous history and expectations, the subject may experience a series of emotions of varying complexity that will shape what is known as the aesthetic experience. Such an experience may sometimes lead to restorative effects in terms of physical and psychological health.

In this sense, for Cuthbert (2006, p. 174), an aesthetically pleasurable experience is one that provides “pleasurable sensory experiences, pleasing perceptual structure and pleasurable symbolic associations.” This definition offers us a useful guide for describing the various levels of aesthetic perception involved in the appreciation of an urban space, which could be compared to the appreciation of a work of art, since, according to Fenner (2003): it implies sensorial perception, cognition and meaning. From this perspective, as outlined above, different formal aspects of a specific setting,

such as consistency of building styles, colors, and materials, etc., may evoke the visual interest of the perceiver and, together with perceiver's previous experiences in either this or similar settings, may shape the aesthetic experience. In our study, the focus of interest will not be the perceptual processes of the aesthetic experience, but rather the consequences of the experience in terms of restoration.

Environmental psychologists and other scholars and practitioners have been interested in how natural environments contribute to human health and well-being for almost four decades now; although the origins of this approach date back to the last third of the nineteenth century and the works of Frederick Law Olmsted (Twombly, 2010). Research into this topic has generally been based on two different yet equally well-known frameworks: Attention Restoration Theory (ART) developed by Kaplan and Kaplan (1989) and Stress Recovery Theory (SRT), postulated by Roger Ulrich (Ulrich, 1981, 1993; Ulrich et al., 1991).

ART states that natural environments can restore the cognitive resources that people use in their daily performance (work, studies, responsibilities, etc.), as long as they are experienced as psychologically distant from daily context (*being away*), have a rich, complex, and well-organized content (*extent*), are aesthetic and interesting (*fascination*), and fit their needs and inclinations (*compatibility*). According to this theory, the involuntary attention triggered by natural scenes is responsible for the recovery of voluntary attention and the reduction of the irritability and frustration that stem from attentional fatigue.

For its part, Ulrich's theory postulates that the stress response

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elicited by some life events, despite its adaptative value, is followed by the consumption of psychological energy and the emergence of a negative emotional state. Thus, a positive affective response to open natural environments will allow the individual to recover from fatigue and its negative emotional outcomes. According to SRT, the main environmental features underlying this emotional reaction are the number of natural elements, the openness, depth, and moderate complexity of the setting and the absence of threats and diversionary demands.

Therefore, the two frameworks give a different degree of prominence to the cognitive and emotional processes and describe the restorative experience in different ways. Nonetheless, both can be understood on the basis of Simmel's classic proposal (1984), which defines the urban environment in terms of an overload of stimuli that leads to saturation, a decrease in social interactions and an undesirable stress response among citizens. In this sense, both agree on the fact that modern life challenges human resources and may lead to a psychological state characterized by low task-performance and negative emotional outcomes (Bratman et al., 2012). These very influential contributions have inspired a substantial body of research, and as a result, a large amount of supporting evidence has been gathered. Research has explored the cognitive and the emotional effects of restorative experiences indistinctly, showing an inherent integration of the two frameworks. Evidence of restorative effects has been found in laboratory (van den Berg et al., 2003; Berto, 2005), field (Hartig et al., 2003; Gatersleben & Andrews, 2013; Tyrväinen et al., 2014), and survey-based studies (Korpela et al., 2010).

2.1.2 *Two possible biases*

For decades, an important part of the discourse of and the research conducted in the social sciences has considered cities as settings which could give rise to psychological health problems and social disruption phenomena through social, economic, environmental and spatial factors (Marsella, 1998; Milgram, 1970; Nelson et al., 1998). This negative view of the city may have influenced the study of the psychology of restoration as well. In fact, in the paradigmatic works of Ulrich and the Kaplans we find direct and indirect allusions to the marked contrast between natural and urban environments in terms of restorative potential. Both ART and SRT present nature as “healing” and describe cities, or life in cities, as the opposite. The urban environment is consequently seen as more stressful and less attractive than nature, and in some way responsible for the negative effects that then require contact with Nature in order to be redressed.

In this sense, many studies in the last two decades have compared natural environments to urban environments characterized by a high presence of noise, pollution, traffic congestion and, in most cases, little aesthetic value (see for example Berman et al., 2008; Park et al., 2010; Takayama et al., 2014). In the words of Karmanov and Hamel (2008) “the urban environments of earlier studies seem often to have been chosen so as to emphasize the difference in restorative potential between nature and city. Not surprisingly, such urban environments were found to have little or no restorative potential” (p. 122). Other authors seem to agree with this analysis (Fornara, 2011; Fornara & Troffa, 2009; Korpela et al., 2010). Moreover, a recent publication pointed out another bias that may have affected research in this area. Staats et al. (2016) claim that when selecting natural

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environments, studies have chosen ones with recreational purposes, while urban environments, usually streets, were places for transport. Given this possible place selection bias, some of the knowledge gathered to date may somehow be partial and inaccurate.

As a result of the biases described above, previous research may have developed a distorted or misapprehended image of the city's restorative potential, even perhaps contributing to maintain the Manichean urban-nature dichotomy. If so, additional research is required to overcome such limitations, in line with a very recent book on positive environmental psychology that outlines the positive value of urban environments (Corral et al., 2014). This piece of research aims to do just that.

2.1.3 The Emergence of a New Question

If the situation is indeed as described in the previous section, new research is required, and this in fact coincides with recent results reported in this area. Several studies have pointed out that not every piece of nature is equally restorative. Natural environments have been found to be more restorative when they offer more prospect and less refuge views (Gatersleben & Andrews, 2013), contain more mystery (Szolosi, Watson, & Ruddell, 2014), are not scary (Milligan & Bingley, 2007), are more fascinating (Berto, Baroni, Zainaghi, & Bettella, 2010), and are less "wild" or even less natural (Martens et al., 2011). In relation to this last observation, one might also add that human use of many natural environments, such as deserts, jungles, and mountains, may prove itself not only not restorative but actually dangerous, risky, and harmful. With this in mind, if nature contains different levels of restorative potential, then urban places could be expected to do so also.

Furthermore, even in the event of nature being always more restorative than urban environments, this does not necessarily mean that urban places can never be restorative. Theoretically speaking at least, some urban scenes could meet, to some extent, the criteria of restorative places and may therefore be restorative too. One experimental study supports this idea (Karmanov & Hamel, 2008): subjects who watched a 10-min video of a natural landscape reported a significant decrease in three affective variables (anger, tension, and depression), whereas those who watched a video of an urban landscape reported a decrease in just two (anger and tension). So far, these results are compatible with the idea that urban places can be restorative, although, as stated earlier, maybe not to the same degree as natural ones. Taken together, the results of the studies reviewed here suggest that a restorative environment, or in general terms a *positive environment* (Corral et al., 2014), may be either humanized nature or naturalized city. In this sense, two areas of future research can be identified: the patterns of humanization and management that make nature more *restorative* and *positive* and the ones that do the same in the urban context.

Additional support for the claim that urban settings might be restorative may come from research about *perceived restorativeness*. Galindo and Hidalgo (2005) published a study in which three kinds of urban environments (cultural/historical, recreational, and panoramic) were perceived as quite restorative by a group of citizens. Using these same categories, subsequent studies (Fornara & Troffa, 2009; Fornara, 2011) found that historical and panoramic urban settings had a similar restorative value to urban green parks. Environmental preference is closely related to actual restoration (Kaplan & Kaplan, 1989), so if people perceive some urban

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settings as restorative, this may indeed render them restorative. Even if this assumption is accurate, in our view it is necessary to avoid the tautological simplification of considering that “restorative is what is perceived as restorative.” The challenge is to further understand the specific qualities of the urban landscape that might improve the psychological state of citizens.

In this sense, according to a meta-analysis by Stamps (2004), Kaplan and Kaplan’s preference matrix offers no clear and conclusive results. As van der Jagt, Craig, Anable, Brewer and Pearson (2014) state, this proposal is based on an evolutionary point of view: aesthetic preferences would have been shaped by survival opportunities, helping humans to make adaptative habitat decisions. This goes along the lines of other evolutionary explanations for cross-cultural consistencies in landscape preferences, both in terms of landscape configuration and composition (Parsons & Daniel, 2002).

However, we could also argue that phylogenetic factors are not the only ones to influence landscape preference. After millions of years of evolution, human beings are something more than the result of having interacted with key elements for survival. In this sense, we should explore not only what every member of the species has in common, but also what belongs to each social group or even to each individual as a result of the relationship established with the environment in a given spatio-temporal context.

Apart from its theoretical interest, research on urban restoration may have a valuable application within health and urban policies. The number of people living in cities all over the world is constantly increasing,

as are stress-related problems (Fuller, Irvine, Devine-Wright, Warren, & Gaston, 2007; van den Berg, Hartig, & Staats, 2007). A recently published paper claims that restorative experiences in urban settings are of particular interest in this context (Staats et al., 2016). Frequent access to nature for citizens may be difficult due to economic, social, and geographical reasons, and restorative urban places (since they are everyday settings, which are easier and cheaper to visit) may therefore be highly beneficial (Subiza-Pérez et al., 2017). Applying the Restorative Environment approach to cities may be an effective way of ameliorating urban life and contributing to citizens' health and well-being.

In this study, we use the field studies method conducted in other works (Park et al., 2010; Roe & Aspinnall, 2011; Tyrväinen et al., 2014) to assess the restorative capacity of urban settings. Although there is evidence supporting the idea that public urban parks and university campuses are restorative (Berman et al., 2008; Butryn & Furst, 2003; Hansmann, Hug, & Seeland, 2007; Peschardt & Stigsdotter, 2013; Weng & Chiang, 2014), these are among the "greenest" urban settings, and our intention is to focus on other kind of urban places where the built environment is the predominant factor.

As stated above, the research question that motivated this study was whether open urban places can be restorative for their users. Thus, we chose two public squares or "plazas" as our experimental settings, in an attempt to overcome the biases described in the previous section. Two hypotheses were established:

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- **H1** Participants spending some rest time in public squares will improve their psychological state in both attentional and affective terms therefore showing that public urban squares can be restorative.
- **H2** Urban squares characterized by a greater presence of natural elements, extent and mystery will prove themselves more restorative than squares with lower levels of these variables.

The reason for choosing squares as study settings lies in the sociopetal nature of this kind of urban element. Paul Zucker (1959), in his seminal work *“Town and Square. From the Agora to the Village Green”* defined the square as the tri-dimensional space formed by the ground, the façades of the surrounding buildings and the sky. Modern publications briefly present them as open spaces surrounded by buildings (Moughtin & Mertens, 2003). The public squares selected for this study have a strong symbolic and institutional value since a government building (in the first square) and a church (in the second) “dominate” the landscape— to use Zucker’s terminology. Morphologically speaking, they belong to two different categories of squares, the first being “wide” and the second one “deep,” according to Sitte’s typology (cited in, Moughtin & Mertens, 2003). What they both have in common are the possibilities they offer to the urban perceiver, such as increased visual perspective and diversity of uses beyond urban transit. Therefore, these squares are not mere passing places, but rather enclaves that encourage appropriation.

2.2 Materials and methods

2.2.1 Sample

Forty-six students from the University of Basque Country (35 women, 11 men; mean age 22.15 years) participated in this study. All were students from the Psychology Faculty and had worked for 3.70 ($SD = 1.62$) and 19.91 ($SD = 9.95$) hours respectively the day and week immediately prior to the experiment. Thus, they were expected to show some attentional fatigue and emotional distress due to their daily university activities (attendance at lectures, group-work and individual study).

2.2.2 Description of the Public Squares

As stated in the Introduction, the authors were interested in selecting a specific kind of urban environment: the urban “plaza” or square. Thus, two squares were selected: Gipuzkoa Square (public square 1) and Katalunia Square (public square 2), which are representative of the city center and another important neighborhood in the city and are well known by the vast majority of citizens. Figures 2.1 and 2.2 are photographs of the selected places.

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Figure 2.1. Pictures of Place 1

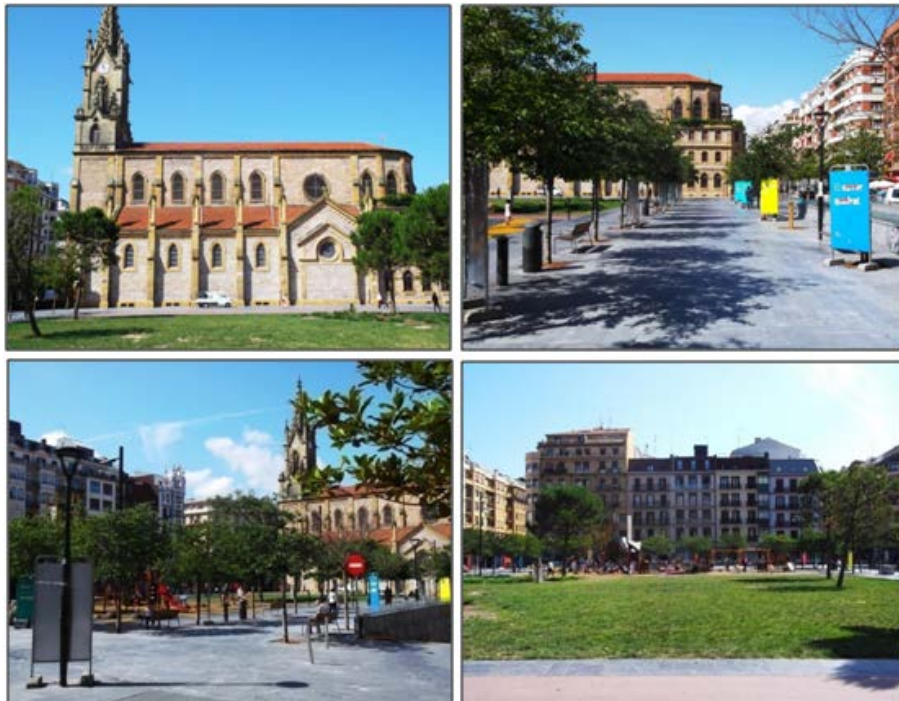


Figure 2.2. Pictures of Place 2

In order to conduct an objective assessment of the squares to be used as experimental settings, a short evaluation sheet was designed by the authors. This instrument comprised three different sections focused on the presence of natural elements (i.e., grass, trees, and water), the architectural variation of the surrounding buildings and a series of psycho- environmental variables, including, among others, coherence and mystery. This instrument tried to capture the most important psycho-environmental features related to landscape preference, landscape aesthetics, ART and SRT. The public squares were evaluated by three psychology undergraduates¹⁹ who collaborated in the research tasks. All were specifically trained in the use of the instrument by the authors. Evaluation results are shown in Table 3.

Given the similar place category (square) and the day and hour chosen for the experiment, both public squares were found to have a comparable atmosphere. Since they are squares, they are specially designed to be recreational areas for the city inhabitants and are fully integrated, both physically and symbolically, into the urban dynamics. Because of this, they are well-maintained and equipped. However, a low level of environmental disturbance from traffic and construction work was also perceived. The social landscape is characterized by two main activities. Firstly, a large number of commuters, i.e., people passing through the square on their way to somewhere else. Secondly, a certain number of people spending time in the square, generally chatting with others, contemplating the place while sitting

¹⁹ Although only the independent evaluation results are presented here, the authors also evaluated both settings using the same tool, obtaining similar results to the ones shown here.

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on a bench, looking after children or people with special needs, or simply enjoying a short rest. Public squares 1 and 2 also have some built elements that contribute to the singularity, beauty, and interest of each one of them: works of art and singular constructions (public square 1) and a church, bars, shops, and a children's playground (public square 2).

Table 2.1.

Results of the objective environmental evaluation of the two settings

	Place 1	Place 2
<i>Natural elements: density [0-20]</i>	10.67 (2.08)	4 (1)
<i>Natural elements: diversity [0-15]</i>	8.67 (0.58)	4.33 (0,58)
<i>Architectural variation [0-16]</i>	1.67 (1.53)	4.67 (1.53)
<i>Psycho-environmental indexes:</i>		
<i>Orientation [0-4]</i>	3 (1)	5 (0)
<i>Coherence [0-4]</i>	3.44 (1.35)	4.33 (0.58)
<i>Enclosure [0-5]</i>	3.56 (0.51)	0.44 (0.51)
<i>Imageability [0-5]</i>	4.22 (0.69)	4.11 (0.84)
<i>Prospect [0-5]</i>	1.33 (0.58)	4.33 (0.58)
<i>Mystery [0-5]</i>	4.33 (0.58)	1 (1.73)
<i>Singularity [0-5]</i>	4.67 (0.58)	3 (1)
<i>Identity [0-5]</i>	5 (0)	3.33 (1.16)
<i>Uniqueness [0-5]</i>	5 (0)	3 (1)
<i>Exploration [0-5]</i>	3.22 (0.51)	2.67 (0.58)
<i>Tranquility [0-5]</i>	2.33 (1.53)	2.67 (1.53)

Note: the table shows the mean score and standard deviation for each environmental variable assessed by the raters. Greater ratings indicate a higher presence of these environmental features in the setting. Numbers inside square brackets define the range of possible scores for each variable.

Despite the similarities described above, however, the two places were selected because of their marked differences in other attributes. Perhaps the most noteworthy contrast lies in the number of green elements. While public square 1 has a large number and variety of perennial trees, plants and grass, public square 2 has much less greenery, just a few deciduous trees with no leaves at the time of the experiment and one small patch of grass. Public square 1 is rich in other natural elements also, since it has a pond with swans and little waterfall.

Public squares 1 and 2 are also dissimilar as regards some of the psycho-environmental factors described in previous literature (Ulrich, 1981, 1993; Kaplan and Kaplan, 1989). Public square 1 has a fair degree of mystery and enclosure while Public square 2 has none of these features. Finally, although public square 2 is more legible, open and with less diversity of elements, the authors believe that, due to its singularity and greenness, public square 1 is more likely to generate a more vivid image and memory.

Consequently, the second study hypothesis is that public square 1, having more greenery, mystery and extent, as well as greater aesthetic potential, will be more restorative than public square

2.2.3 Instruments

We designed a *Brief General Data Questionnaire*, which included some demographic information (age, gender, and years of residence in the city). Additionally, subjects were asked to report the total number of hours worked on the day of the experiment and since the start of the week (from Monday). The word “work” refers to hours of cognitive performance and voluntary attention activity. It includes attendance at lectures, studying, voluntary

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service and paid work.

Following Bringslimark et al (2009), we included instruments used in previous studies in order to move toward a standard measurement kit which will facilitate the comparison between studies and the gathering of results. Examples of the use of these instruments are the works by Bodin and Hartig (2003), Lethbridge et al. (2005), Park et al. (2010), Tsunetsugu et al. (2013), and van den Berg et al. (2003).

Cognitive performance was assessed using the *Symbol Digit Modalities Test* (SDMT), in which subjects are asked to pair specific numbers to symbols in accordance with the given test key at 90-s intervals. The score (120 maximum) is calculated by subtracting the number of errors from the total number of answers. In order to avoid learning effects, we used two parallel versions designed previously (Hinton-Bayre & Geffen, 2005; Hinton-Bayre, Geffen, & McFarland, 1997).

Affective state was measured using the Short Spanish Version of the *Profile of Mood States* (POMS) adapted by Andrade, Arce, De Francisco, Torrado & Garrido (2013). In this instrument, subjects are asked to rate 25 adjectives expressing affective states on five-point Likert-type scale from 0 to 4 (0 = *not at all*, 4 = *extremely*). The items are grouped into five dimensions: tension-anxiety, depression-dejection, anger- hostility, fatigue and vigor. We also used the *Overall Happiness Scale* (OHS) and the *Overall Stress Scale* (OSS). In both measures, subjects are asked to rate their total happiness and perceived level of stress at the moment of answering, with possible scores from 1 to 100.

Participants also completed the *Perceived Restorativeness Scale* (PRS, Hartig, Korpela, Evans, & Gärling, 1997). This instrument is a widely used 16-item scale that comprises the four main components of Restorative Environments according to ART: *being away*, *extent (coherence)*, *fascination*, and *compatibility*. Here, the Spanish adaptation (Hidalgo and Hernández, 2001) was used in conjunction with a 6-point Likert-type scale.

For all the instruments used in the study (SDMT, POMS, OHS, OSS, and PRS), higher ratings indicate a larger presence of the variable for the subject in each data collection moment.

2.4 Procedure

Once they had been contacted and informed of the nature of the study, interested students stated their time availability. Using this information, groups of between 3 and 7 participants ($X=4.18$; $SD=1.54$) were formed and randomly assigned to one of the experimental settings on a specific day, with 21 subjects being assigned to public square 1 and 25 to public square 2. Experimental sessions took place between October 14th and November 6th and lasted around an hour and a half, from 15.30 to 17.00.

Subjects were asked to meet up at a street close to the experimental setting, where they were provided with further information about the activity and research project and gave their informed consent. Before going to the setting, they completed the general data questionnaire and the pretest. After completing the pretest, they were taken to the setting in a <2 min walk and asked to complete the PRS before entering the square. They did so in an adjacent street that allowed for visual contemplation of the setting. The environmental intervention designed for this study was inspired

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by previous research (Park et al., 2010; Takayama et al., 2014; Tyrväinen et al., 2014), and was 30 min long, divided in two phases; static contemplation (20') and exploration (10'). This environmental intervention design enables two levels of immersion in the landscape: contemplative and explorative. It has been argued that restoration is only achievable if individuals are able to immerse themselves in the environment and feel that they are part of it (San-Juan, 2013). The authors believe that this outcome is easier to achieve in this way than through laboratory or merely contemplative activities. Moreover, the authors were interested in using a similar design to that used in previous research in order to facilitate homogenization and enable comparisons between studies. Thus, participants were first instructed to sit on a bench for 20 min and to contemplate their surroundings, avoiding social interaction, the use of technological devices and the consumption of alcohol or tobacco. In the following exploration phase, they were asked to explore and walk around the square, while still subject to the same restrictions (no social interaction, technological devices, drinking, or smoking). The most usual activities during this phase were walking around, sitting on other benches and contemplating the place from different viewpoints. Finally, participants completed the posttest and, after being thanked, left. A representation of the experimental procedure is showed in Figure 2.3.

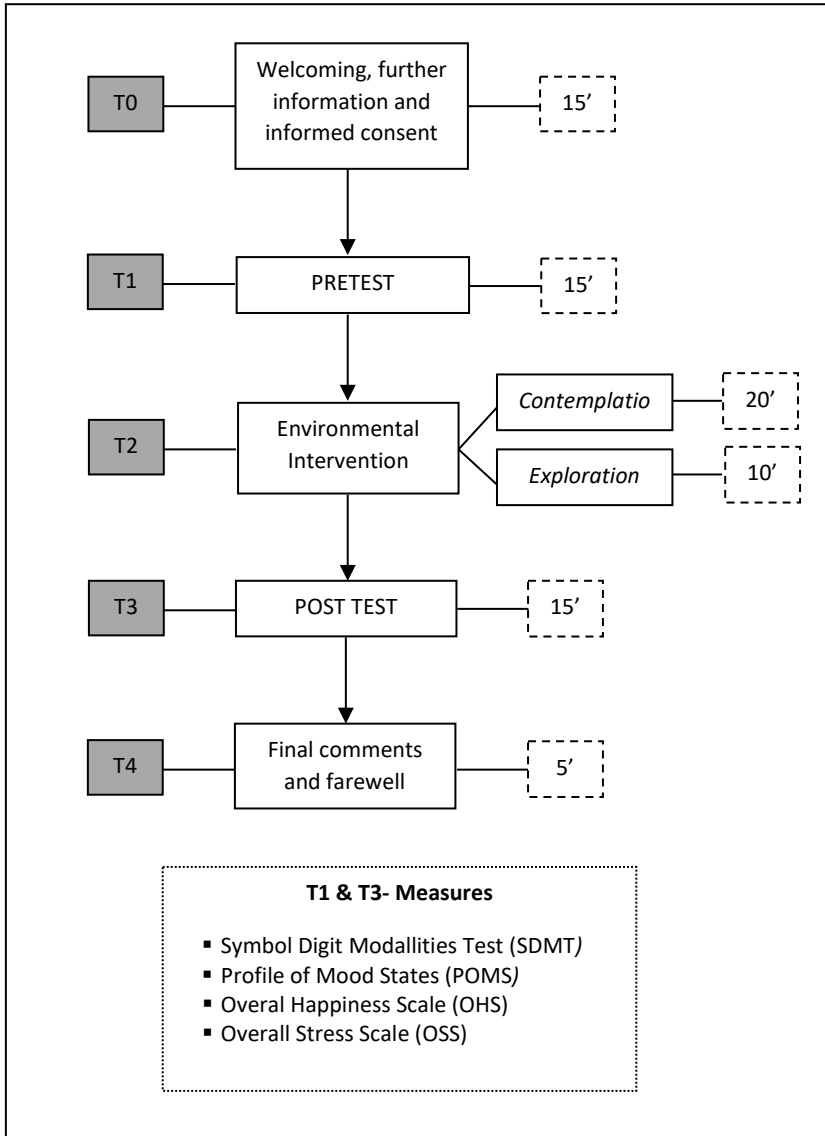


Figure 2.3. Schema of the experimental procedure designed for this study. Minutes are the unit of time used for the description of each part of the procedure.

2.2.5 Data Analysis

We compared pretest and posttest scores (MANOVA) for the cognitive and affective variables included in order to detect any significant differences prior to the experience of the squares. Then, in order to analyze the psychological effect of the environmental intervention and answer the study hypotheses, pretest and posttest scores were compared using a two-factor (*time*-within subjects and *place* -between subjects) repeated measures MANOVA. Both analyses were done using Bonferroni correction for multiple comparisons. Due to the limitations of ηp^2 as an index of effect size (Lakens, 2013; Levine & Hullet, 2002; Richardson, 2011; Yigit & Mendes, 2018), we calculated ω^2 for within-subjects designs and interpreted them following Kotrlik & Williams's recommendations (2003)²⁰. Additionally, an inter-subject comparison of the PRS scores for the experimental settings was run using multivariate analysis of variance (MANOVA). Effect size of these differences was calculated with between-subjects designs ω^2 . See figures 2.4 and 2.5.

$$\omega^2 = \frac{df_{\text{Effect}} \cdot (MS_{\text{Effect}} - MS_{\text{Effect} \times \text{Subject}})}{SS_{\text{Total}} + MS_{\text{Subject}}}$$

Figure 2.4. Formula used to calculate within-subjects ω^2 .

²⁰ In absence of other similar studies to classify these effects, we resorted to the classical Cohen's proposal even though the former option would had been more recommendable (Lakens, 2013). Following Kotrlik & Williams (2003) $\hat{\omega}^2 = .01$ indicates a small effect size, $\hat{\omega}^2 = .059$ a medium effect size and $\hat{\omega}^2 = .138$ a large one.

$$\omega^2 = \frac{SS_{\text{Effect}} - df_{\text{Effect}} \cdot MS_{\text{Error}}}{SS_{\text{Total}} + MS_{\text{Error}}}$$

Figure 2.5. Formula used to calculate between-subjects ω^2 .

2.3 Results

Before focusing on any possible restoration achieved by participants, their psychological state at the start of the experiment was analyzed. According to pretest measures, even though subjects had worked an average of almost 4 hours on the day of the experiment and 20 since the beginning of the week, their attentional fatigue and emotional distress levels could be described as low. *SDMT* scores revealed a low error rate and a good level of general performance. Participants' scores were low to very low for *tension-anxiety*, *depression-dejection*, *anger-hostility*, and *fatigue*. Finally, they reported a medium-low level of *stress* and a medium-high level of *happiness*. Table 2.3 shows the average scores for pretest and posttest variables in each study settings. An initial MANOVA test with Bonferroni correction was carried out to detect whether there were any significant differences between groups as regards the number of hours worked and their psychological condition at the beginning of the experiment. No differences were found.

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Table 2.2

Pretest-posttest scores by public square

Measure	Public square 1		Public square 2	
	Pretest	Posttest	Pretest	Posttest
Hours worked that day	3.38 (1.88)	-	3.96 (1.36)	-
Hours worked that week	19.91 (10.59)	-	19.92 (9.61)	-
<i>SDMT – Mistakes</i>	1.33 (1.39)	0.67 (0.91)	1.04 (1.65)	0.60 (0.82)
<i>SDMT – General Score [0-120]</i>	60.86 (7.34)	64.67 (8.52)	57.08 (8.92)	62.08 (9.45)
<i>Tension-Anxiety [0-4]</i>	1.01 (0.86)	0.35 (0.42)	1.06 (0.83)	0.42 (0.56)
<i>Depression-Dejection [0-4]</i>	0.2 (0.38)	0.19 (0.28)	0.44 (0.52)	0.37 (0.46)
<i>Anger-Hostility [0-4]</i>	0.42 (0.64)	0.13 (0.27)	0.46 (0.67)	0.17 (0.39)
<i>Fatigue [0-4]</i>	0.99 (0.86)	0.74 (0.82)	1.23 (1.02)	0.79 (0.63)
<i>Vigor [0-4]</i>	2.04 (0.78)	1.71 (0.62)	1.63 (1.06)	1.50 (0.87)
<i>TMD [0-(-16)]</i>	0.58 (2.62)	-0.29 (1.54)	1.57 (2.94)	0.25 (1.82)
<i>Stress [0-100]</i>	37.05 (21.94)	23.38 (19.03)	41.60 (24.18)	17.60 (15.62)
<i>Happiness [0-100]</i>	69.81 (16.96)	76.48 (15.06)	59.40 (18.22)	69.40 (14.24)

Note: average, standard deviation for pretest and posttest scores for each of the variables included in the field questionnaire for both experimental settings. *TMD* = Total Mood Disturbance

Repeated measures factorial MANOVA revealed a second order effect *time x place* for *Sress* [F (1,44) = 5.46; $p = .024$; $\omega^2 = .01$] indicating that visitors of public square 2 got a greater stress restoration experience. The effect of this interaction is small in size. No other second order effects were detected.

Time produced significant changes for all the variables but *Depression-Dejection* [F (1,44) = 0.46; $p = .500$; $\omega^2 < .01$]. Thus, the environmental treatment significantly increased *SDMT-Global Score* [F (1,44) = 29.86; $p < .001$; $\omega^2 = .06$] and *Happiness* scores [F (1,44) = 19.49; $p < .001$; $\omega^2 = .06$]. Additionally, decreased *SDMT-errors* [F (1,44) = 5.09; $p = .029$; $\omega^2 = .04$], *Tension-Anxiety* [F (1,44) = 47.22; $p < .001$; $\omega^2 = .18$], *Anger-Hostility* [F (1,44) = 15.10; $p < .001$; $\omega^2 = .07$], *Fatigue* [F (1,44) = 13.50; $p = .001$; $\omega^2 = .04$], *Vigor* [F (1,44) = 6.25; $p = .016$; $\omega^2 = .01$], *TMD* [F (1,44) = 8.18; $p = .010$; $\omega^2 = .05$] and *Stress* [F (1,44) 72.50; $p < .001$; $\omega^2 = .18$]. The size of these changes are small for *SDMT-errors*, *Fatigue* and *Vigor*, medium for *SDMT-Global Score*, *Happiness*, *Anger-Hostility* and *TMD*. The decreases in *Tension-Anxiety* and *Stress* are large.

As it is shown in Table 2.3, *PRS* scores for each place were compared using a MANOVA. *PRS* overall score in public square 1 was greater than in public square 2. It also scored higher than public square 2 in *being away* and *fascination*. The size of these effects were small, small and medium respectively.

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Table 2.3.

PRS Scores by public square and ANOVA results

Measure	Public square 1	Public square 2	F (1,44)	<i>p</i>	ω^2
<i>PRS – Overall score [0-5]**</i>	2.53 (0.59)	2.07 (0.59)	7.41	.009	.01
<i>Being Away [0-5]*</i>	2.69 (0.78)	2.18 (0.88)	4.14	.048	.01
<i>Coherence [0-5]</i>	3.11 (0.61)	3.02 (0.89)	0.14	.706	< .01
<i>Extent [0-5]</i>	2.11 (0.74)	1.89 (0.69)	1.05	.311	< .01
<i>Fascination [0-5]***</i>	2.17 (0.74)	1.30 (0.60)	19.13	<.001	.05
<i>Compatibility [0-5]</i>	2.65 (0.80)	2.20 (0.85)	3.40	.072	.01

Note: mean, standard deviation of PRS scores by public square. *F* statistic, *p* value and *d* are given for each of the above variables. * = *p* value < .05; ** = *p* value < .01; *** = *p* value < .001.

2.4 Discussion

The main aim of this study was to test the restorative potential of public squares in order to provide an, at least initial, answer to the research question (Are public open places restorative?). This is an idea that has been proposed previously by other authors (Galindo & Hidalgo, 2005; Karmanov & Hamel, 2008; Fornara & Troffa, 2009; Fornara, 2011). The first hypothesis (H₁) proposed that public urban squares are restorative. The results obtained support this hypothesis, since participants reported a better psychological state after spending some time in an urban square. Visitors to both places had better cognitive performance, reduced negative affect variables (tension-anxiety, anger-hostility, fatigue, and stress) and reported an increase in happiness after spending 30 min in the square. These results may provide information about the existence of the restoration process, or a similar one, in urban environments. This set of results is relevant due to the existence of previous research finding no restoration, or even documenting

a deterioration of psychological variables, in urban contexts (Berman et al., 2008; Park et al., 2010; Tsunetsugu et al., 2013; Takayama et al., 2014). In this point it is also worthy to recall a study conducted by Roe and Aspinall (2011; Study 2) showing that an urban walk produced a significant increase in hedonic tone and stress reduction in a sample of adults with poor mental health.

The second hypothesis of the study (H2) stated that due to some of its features (greenness, mystery, and extent), and according to the classical premises of restoration theory, public square 1 would elicit higher restoration rates than public square 2. Participants' ratings of the Places were found to be congruent with this hypothesis, with public square 1 scoring higher for *perceived restorativeness* overall score), *being away*, and *fascination*. However results showed that participants achieved comparable restorative experience regardless of the public square to which they were assigned. Indeed the detected *time x place* interaction for *Stress* went in the opposite direction, showing that visitors to the second public square got higher stress restoration ratings. Since no other differences between the squares were found, it could be concluded that their restorative potential is similar²¹. This finding does not allow H2 to be accepted and poses a number of questions since it is not consistent with some of the most widely-accepted

²¹ In page 77 we warned about the risk of equating perceived restoration to actual restoration. Results obtained here indicated a mismatch between the perceived restorative potential of the settings (2.53 and 2.07 respectively in a 0 to 5 scale), moderate in size, and the actual restorative experience with moderate and large effects in most study variables.

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premises of restoration theory. In the following paragraphs, we will try to reflect on this and offer various possible explanations.

From a theoretical point of view, the results obtained may be seen as controversial. ART postulates that greenness and mystery (feature inviting exploration and discovery) are two of the key features of restorative places. Following such postulates, public square 1, which has a higher level of mystery and many more trees, flowers, grass and natural elements than public square 2, should have been more restorative. Existing evidence linking greenness to healthiness (Lee & Maheswaran, 2010; Pearson & Craig, 2014; Sardon, 1988) would also seem to suggest this outcome. We must therefore turn to other approaches in order to explain the results obtained here. White et al. (2010) found that water, an important natural feature for human survival and evolution, and hence related to restoration, functioned differentially in natural and urban settings. Indeed, the more water in the natural pictures, the more perceived restorativeness (PR), whereas in urban pictures, only the presence of water was significant and its increase did not generate more PR. Two ideas emerge from this finding: firstly, that the presence of a specific element, such as water or trees, for example, in urban settings (conceptual presence) might be more influential than its density or the proportion of the place that it takes up; and secondly, that elements that are thought to be important in the context of natural restoration may have a lesser significance in urban settings.

SRT states that, to be restorative, places should be open and have enough prospect. In this sense, since public square 1 is more enclosed, it might be less restorative than public square 2. Studies have found that enclosure, defined as lack of prospect and availability of hiding places could

increase perceptions of insecurity (Cinar & Cubukcu, 2012; Foster, Giles-Corti, & Knuiiman, 2010; Nasar & Jones, 1997; Stamps, 2005). Indeed, the visual and/or locomotive impermeability of green items have been identified as important features related to insecurity in urban contexts (see also Herzog & Chernick, 2000). Therefore, the more enclosed setting (public square 1) may provide a lower level of restoration, in accordance with the postulates of Herzog & Rector (2008)²². We are not suggesting that participants experienced insecurity in public square 1, especially given their profile, the time of the experiment and the overall level of safety in the city, but enclosure could have been an obstacle for achieving a certain level of restoration.

Another possible (and probably complementary) explanation may be the previously mentioned information overload framework. One of the main attributes of urban life is the huge amount of information and the plethora of stimuli that surround people and their daily life performance (Johansson, Hartig, & Staats, 2011; Milgram, 1970; Staats et al., 2016). Classical studies on this topic focused on place-based sources such as crowds, the media, population density, and noise, but in the twenty-first century, digital sources of overwhelming information should also be taken into account (Misra & Stokols, 2012). In a context in which individuals are constantly bombarded by massive amounts of information from their immediate physical and social environments, along with an endless flood of data from the world of technology and internet-based devices, complex, mysterious, rich urban

²² Herzog and Rector (2008) postulated that coping with danger or fear concerns or situations will disrupt or negatively affect the process of restoration in that it requires direct attention efforts and may generate a negative affect response.

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settings full of stimuli may be less restorative. Due to information overload, citizens may well find quiet, open places with a greater prospect and fewer stimuli more relaxing and refreshing than more stimulating ones. From this perspective, public square 1 may have been more psychologically demanding, and therefore less restoring than public square 2. In other words, calm and low-to-medium stimulating settings would be more likely to offer the *soft fascination* needed for restoration. In any case, further research is required using more types of urban settings, with various levels of the aforementioned dimensions, in order to replicate our findings and gather more evidence of the relevance of each dimension in the city.

2.4.1 Limitations and future research directions

The study has a number of limitations which help us define new lines of enquiry for consolidating the research initiated here. Although this is quite frequent in previous experimental research conducted in this area, the sample group was small and composed exclusively of university students. Secondly, the absence of a control group is a weakness that invites to conduct further research using control groups to increase the internal validity of the study. Additional limitations may be that the sample was not balanced in terms of gender and that working with psychology students might have led to a certain degree of bias because they were in a better position to guess the objectives of the study. Broader and more heterogenic samples of citizens will be required to replicate the results and, as stated previously, more (and more diverse) settings should be used in future studies to consolidate this avenue of research into restorative urban settings. Moreover, in our study, an improvement in psychological measures was detected even when the initial state of the participants was not particularly

negative in terms of stress and fatigue. A replication with a more fatigued or stressed sample group is therefore required, since the effect size of the restoration processes may be larger in this case. As regards instruments, only psychological measures were used, and physiological ones may be also useful in this context. The devices and technologies that we now use every day, such as smartphones or watches, may prove useful for collecting heart rate data and other measures. Neither the objective nor the subjective assessment of the experimental setting comprised items linked to the soundscape (natural sounds such as animals, water, etc. and urban sounds such as traffic and road works). Future studies may wish to address the contribution of these elements to the restorative experience. This was an exploratory and pilot study, but in spite of these limitations, the authors believe that it is an interesting and promising avenue of research that has substantial applied potential.

In this sense, and following (Sörqvist, 2016), one of the challenges in environmental psychology is to not take for granted that the built environment is inherently harmful to human well-being, while the natural environment is inherently beneficial. As we stated above, interaction with a virgin, non-humanized, hostile environment may be dissuasive for creating bonds or appropriation processes. On the other hand, as San-Juan and Vozmediano, (2016) suggest, the city is the place where cultural exchange and socialization processes occur, the physical and symbolic reflection of a community. As indicated by authors such as Alexander (1965), Gehl (1987), and Jacobs (1961) among others, urbanism may be a strategy for developing quality of life, health, solidarity, and democracy, but only if we recognize that urban space is not what remains after locating the buildings; on the contrary,

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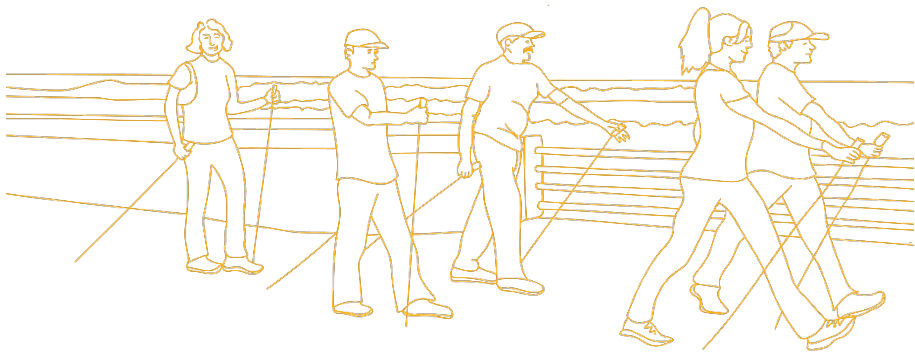
urban design has the potential to create restorative places.

In short, it might be important to remember a very simple fact. ART, SRT, and most of the work they have inspired have been aimed at exploring the effects of nature on psychological health. Thus, it would not be misdirected to think that their approach might require some adaptation—or extension—in order to understand urban restoration. Further research is therefore needed to develop a better understanding of these processes and to collect a broader body of evidence. This brings us back to the idea of the levels of urban naturalization proposed in the Introduction, and we should remember that friendly urban settings may be more affordable, more accessible to more people, and offer a wider variety of possibilities for action and restoration than some natural contexts (wild, virgin, extreme). The study of urban restoration is an important research challenge for both scholars and practitioners, since the applied perspective could provide substantial improvements for the quality of urban life over the coming decades.

2.5 Conclusion

At the beginning of the twentieth century, only 10% of the world's population lived in urban areas. According to recent estimates, this figure will rise to 66% of the population by 2050 (United Nations, 2014), revealing the remarkable success of the urban life. But as the saying goes, too much success can kill you. This study reveals that participants' psychological state improved after spending half an hour in one of the two selected urban squares. These results lead us to conclude that avoiding the collapse of the urban model due to unsustainability cannot be our only aim in relation to the future of our cities. While an adequate management of urban resources, waste and movement

flows is necessary, we argue that urban design can also significantly contribute to improving citizens' well-being and quality of life, reducing their stress and restoring their psychological state. Future research could even reflect on how to design aesthetically pleasurable urban landscapes that we could describe as "*emopetal*," i.e., capable of generating positive emotional experience.



CHAPTER 3

THE RESTORATIVE POTENTIAL OF NORDIC WALKING

The content of this chapter is being reviewed for publication in *Leisure Sciences*: Subiza-Pérez, M., Vozmediano, L., & San Juan, C. A tale of two sticks: walking towards restoration.

3.1 Introduction

3.1.1 The value of leisure for psychological health

Literature on leisure often highlights its value in the maintenance of a balanced health status. It has been stated that job performance, family issues, daily responsibilities and interpersonal relationships often lead to stress and other deleterious psychological outcomes (Iwasaki & Schneider, 2003). In this context, the return to the pre-stressor functioning level may come from activities that foster detachment from the stressor source, increase feelings of relaxation or allow to develop new skills and talents (Sonnentag & Fritz, 2007; Sonnentag & Zijlstra, 2006).

Physically active leisure activities could be good candidates for such a recovery. Exercise has been found to increase positive affect (Reed & Buck, 2009) and reduce depressive and anxiety symptoms (Rethorst, Wipfli, & Landers, 2009; Wipfli, Rethorst, & Landers, 2008). In the same line, evidence points at its protective role against stress (Gerber, Uwe, & Hse, 2009) and its value as auxiliary treatment for clinical disorders (Zschucke, Gaudlitz, & Ströhle, 2013). Of particular interest for this study, a relevant body of literature deals with the added positive effect of performing physical activity in green and outdoor settings (Barton & Pretty, 2010; Mackay & Neill, 2010; T. P. Pasanen, Tyrväinen, & Korpela, 2014; Pretty, Griffin, Sellens, & Pretty, 2003).

In the field of environmental psychology, in the last decades there has been an increasing interest in the study of restoration, defined as the renewal of physical, psychological, and/or social resources diminished in ongoing efforts to meet everyday (Hartig, 2004). Thus, a restorative

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experience allows a person to recover from psychological depletion while improving his/her mood and allowing certain levels of reflection and transcendence (e.g. reflection on life goals, his/her place in the world or his/her relationships with others). This line of research shares part of the premises that inspire investigations in occupational health and recovery from work (De Bloom, Kinnunen, & Korpela, 2014; Sianoja, Syrek, de Bloom, Korpela, & Kinnunen, 2018; Sonnentag & Fritz, 2007; Sonnentag & Zijlstra, 2006), as daily performance is thought to deplete psychological resources (i.e. cognitive and emotional abilities) that can be refreshed by the contact with environments and activities that meet some requirements (Kaplan & Kaplan, 1989; Ulrich, 1993). This noteworthy similarity in conceptual terms (Korpela & Kinnunen, 2011) explains the presence of restoration studies within the main leisure journals (Home, Hunziker, & Bauer, 2012; Von Lindern et al., 2013; Weng & Chiang, 2014; Wöran & Arnberger, 2012).

When dealing with walking, studies on psychological restoration have found that it is an activity leading to improvements in mood (Gidlow et al., 2016; Johansson et al., 2011; Weng & Chiang, 2014). According to a recent review on pretest-posttest studies on the matter, most researchers have used green or natural environments (i.e. forests, urban parks or university campuses) and resorted to university samples (Subiza-Pérez, Vozmediano, & San Juan, 2018). They concluded that adding new activities, environments and samples might result in significant advances in this area of research. Some of these issues will be addressed in the present study.

3.1.2 Nordic Walking

Nordic Walking (NW) can be defined as walking with a pair of poles, similar to the ones used in cross-country skiing (Morgulec-Adamowicz, Marszałek, &

Jagustyn, 2011). Apart from moving lower body muscles, this modality of brisk walking also activates upper body musculature thanks to the use of the poles. This fact increases energy consumption and exerts less pressure on body joints, compared to general walking (Park & Yu, 2015). NW has been presented as suitable for all ages and physical or health conditions because it is inexpensive, easy to perform, does not require high technique or concentration and may cause less injuries than other activities, since performers can use the poles for support. In fact, the use of poles might provide assistance when walking and thus be useful for people with walking impairments (Je-Myung, 2012). Perhaps due to these characteristics NW, after appearing in Finland during the 90's, spread across many other European countries, USA, Canada and Australia (Österlund-Pötzsch, 2013). Nowadays it is practiced around the world and federations and associations, at the international and local levels, are devoted to promoting its practice.

Available evidence presents Nordic Walking (*NW*) as a valuable tool for rehabilitation after injuries or medical interventions, as well as for increasing walking performance, boosting physical endurance and decreasing depression in clinical samples (Lee & Park, 2015; Morgulec-Adamowicz et al., 2011; Skórkowska-Telichowska et al., 2016; Strömbeck, Theander, & Jacobsson, 2007). Another study showed that individuals with normal glucose tolerance regularly practicing NW for 4 months reduced their BMI, improved sleep quality and increased general perceived health, in comparison to control group (Fritz et al., 2011). In the same study, individuals with Type 2 Diabetes Mellitus got better sleep quality and increased their satisfaction with their physical health compared to a control group. Similarly, authors of a review of studies concluded that NW had positive effects in

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several physiological indicators (heart rate, blood pressure, exercise capacity and maximal oxygen consumption among others) in a wide range of clinical disorders (Tschentscher, Niederseer, & Niebauer, 2013).

Therefore, it seems that most studies have been directed towards physical health outcomes and under an overall medical-health perspective (Morgulec-Adamowicz et al., 2011). Conversely, far less is known about the psychological benefits of this activity for the general population. To the knowledge of the authors, the only work analysing the psychological benefits of NW in a general population sample was the one conducted by Stoughton (1992). The author found that practicing NW 4 times a week for 12 weeks led to decreases in feelings of depression, anger, and fatigue and an increase in vigor in a sample of 87 women. It appears that no more studies following Stoughton's work have been developed later, and therefore, the psychological effects of NW remain greatly understudied.

3.1.3 Research Aim

The general aim of the study presented here is to evaluate the psychological value of this leisure modality for the general population. Specifically, we will assess the affective restorative potential of NW for general population. Even though it was not the primarily objective of the study, due to the fact that data was collected in two outdoor different walks varying in their degree of naturalness (built vs green/blue) it was also possible to see whether the environment may affect the psychological outcomes of the activity.

Due to the exploratory nature of this research, we will formulate only the general hypothesis that the practice of NW is restorative. We base this hypothesis in the review of literature shown before regarding physical

activity, well-being and green/outdoor exercise. In this specific study the restorative potential of NW could be complemented by the positive outcomes of the social interactions taking place along the walk, as the activity was done in groups.

Results of the study are expected to provide knowledge about the affective benefits and restoration achieved by the performance of a kind of exercise never studied in these terms (NW). This study will provide leisure scientists and stakeholders with first hand evidence about some of the psychological benefits that could be obtained through the practice of this leisure activity. Besides, the design developed here will allow us to overcome some of the previously exposed limitations of restoration pretest-posttest field studies.

3.2 Methods

3.2.1 Participants, activity and setting description

The sample for this study was composed by 60 middle-aged adults ($M=56.75$; $SD=7.40$), of whom 43 indicated their gender as women (71%). Participants were recruited from two different walks that took place in 2016.

The first walk ($n = 32$) took place on October the 5th (Wednesday) 2016 at 20.00 and lasted one hour. The tour went across the centre of the city where the study was undertaken and was immediately preceded and ended with a short stretching and warming up/muscle-relaxing session. Participants walked mainly through streets presenting the multiplicity of land uses and activities that characterize urban landscape, including a medium level of traffic load. This environment featured low levels of greenness (trees or pots), although some natural elements could be seen in the horizon

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(mountains and hills). Additionally, part of the walk followed the riverside across the city. The second walk ($n=28$) occurred on November the 13th 2016 (Sunday) at 10.00 and took one hour and a half. The tour was completed in the same city, but it had quite more natural content as it went along three beaches. Therefore, participants marched both along the sidewalks by the seaside and the sand of the beaches. None of the participants taking part in the first walk were included in the analyses of the second.

3.2.2 Instruments

The questionnaire comprised two separate parts; the pretest and posttest, which contained the same 4 affective scales. The demographic section asked participants their age, gender and the number of hours that they had worked since the beginning of that day and week. The word “work” was used in an open sense; as hours of cognitive performance and voluntary attention activity (following ART postulates). It includes work but also attendance to lectures, studying, voluntary service, and so on.

The Spanish short adaptation of the *Profile of Mood States* (Andrade et al., 2013) consists of 25 adjectives describing affective states that can be grouped in five dimensions: *tension-anxiety*, *depression-dejection*, *anger-hostility*, *fatigue* and *vigor* and summarized in a *Total Mood Disturbance* index. The rating scale ranged from 0 (*nothing*) to 4 (*a lot*). The Spanish short version of *The Positive Affect Schedule* (Robles & Páez, 2003) was used as well, with the same rating scale. The 10 items belong to a unique dimension of *positive affect*. Finally, two 0 to 100 thermometer-like scales were used to measure *stress* and *happiness* (van den Berg et al., 2003).

The posttest section of the questionnaire additionally included the *Spanish Adaptation of the Restoration Outcome Scale (ROS-S; Subiza-Pérez et al., 2017)*. This instrument, using a 0 to 5 scale, includes items related to the main components of a *restorative experience: relaxation and calmness, attention restoration, clearing one's thoughts and reflection*.

3.2.3 Procedure

Regular attendants to the walks scheduled by the Association of Nordic Walking of Donostia-San Sebastián were informed about the nature of the study by one of the researchers and the monitors of the activity weeks before data collection. Implications and practicalities of taking part in the study (date, duration and procedure) were also discussed following the recommendations of the Ethics Committee of the University of the Basque Country UPV/EHU. In the data collection day, walk attendants were again approached and invited to join the study. Participants were given the questionnaires and instructed to fill in the pretest part before starting the activity. After the post-walk stretching session, participants answered the posttest section. Finally, they were debriefed and thanked. A summary of the procedure is shown in Figure 3.1.

This study was conducted following the ethics guidelines of the Ethics Committee for Research on Human Beings –University of the University of the Basque Country UPV/EHU. Informed consent was orally asked and given before the data collection. Participants were not required to sign a document as authors did not collect personal identification data (i.e. name or ID).

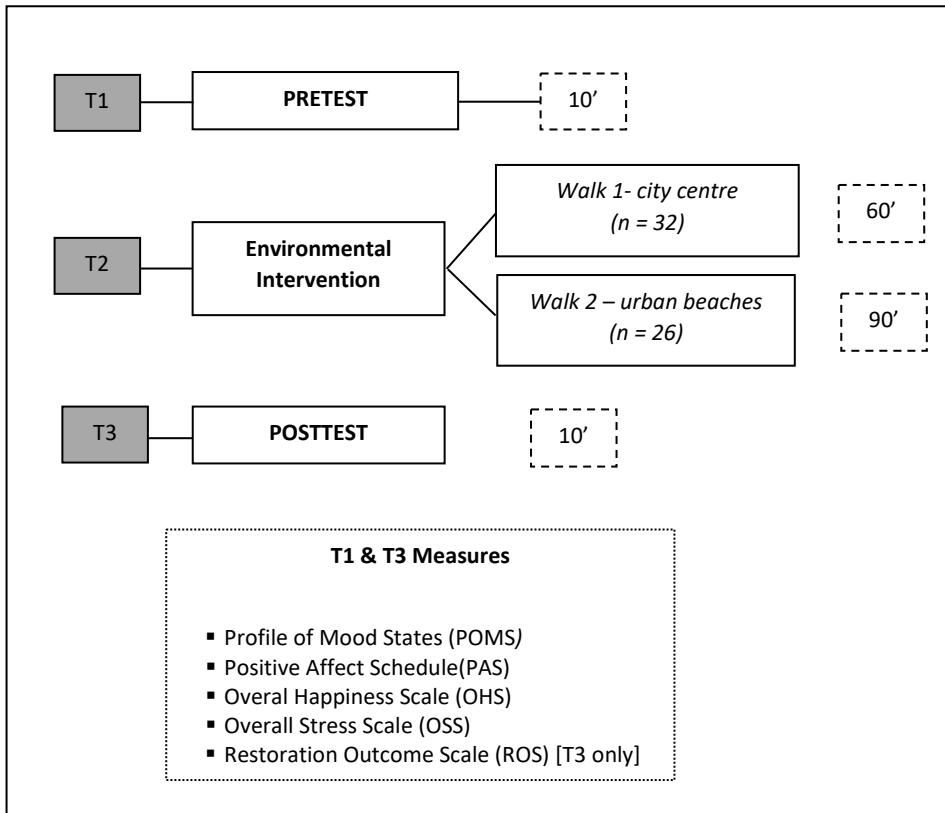


Figure 3.1. Schema of the experimental procedure designed for this study. Minutes are the unit of time used for the description of each part of the procedure.

3.2.4 Data analysis

Pretest and posttest scores in the study scales were compared using repeated measures MANOVA with Bonferroni correction. When significant differences among such scores were detected, effect size was calculated using ω^2 for within-subjects designs. The formula is depicted in Figure 2.4 (see page 89).

3.3 Results

3.3.1 Results of first walk

According to their answers to the questionnaire, participants had worked an average of 6.86 ($SD= 2.78$) and 22.48 ($SD= 15.78$) hours, respectively, the day of and the week before data collection took place. The initial psychological state of the participants can be inferred from the pretest scores and might be described as generally good, as it can be extracted from the Total Mood Disturbance (*TMD*) index. Concretely, they showed low levels of Tension-Anxiety, Depression-Dejection, Anger-Hostility and Fatigue whereas their level of Vigor and Positive Affect was moderate. The Stress mean score was also moderate and the Happiness one, medium-high.

Repeated measures MANOVA test run for assessing the differences between pretest and posttest scores in the study variables showed some statistically significant results. Participants attending the walk session got a significant reduction in *tension-anxiety*, *depression-dejection*, and *anger-hostility*. They also increased their level of *vigor* and perceived *happiness* while experiencing a decrease in *stress*. The magnitude of the effect sizes of these changes is small and medium ($\omega^2 = .02$ -.0.13) but for Stress and Happiness, which might be considered large ($\omega^2 = .23$ and .17 respectively). These results are displayed in Table 3.1.

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Table 3.1.

Pretest-Posttest differences for walk 1

Measure	Pretest	Posttest	F (1,27)	<i>p</i>	ω^2
<i>Tension-Anxiety</i> ***	0.78 (0.86)	0.28 (0.36)	15.85	<.001	.13
<i>Depression-Dejection</i> **	0.54 (0.69)	0.21 (0.40)	11.46	.002	.08
<i>Anger-Hostility</i> *	0.31 (0.66)	0.13 (0.33)	4.26	.047	.02
<i>Fatigue</i>	0.87 (0.83)	0.94 (0.70)	0.71	.792	< .01
<i>Vigor</i> *	2.46 (0.83)	2.77 (0.80)	6.13	.019	.06
<i>TMD</i> **	0.05 (2.98)	-1.21 (1.56)	11.25	.002	.07
<i>Positive Affect</i>	2.16 (0.64)	2.32 (0.78)	3.02	.092	.01
<i>Stress</i> ***	42.42(29.77)	16.37 (19.76)	30.36	<.001	.23
<i>Happiness</i> ***	69.35 (20.30)	83.54 (11.94)	21.01	<.001	.17

Note: mean, standard deviation of walk 1 for pretest and posttest scores, F statistic value, *p* value and ω^2 are referred for each of the variables above. *= *p* value < .05; ** = *p* value < .01; *** = *p* value < .001. *TMD* = Total Mood Disturbance.

In Table 3.2 the scores *ROS-S* scores for this walk are displayed. The global *ROS-S* score indicated that the walk was rated by the participants as restorative, as it got a mean of 3.17 out of 5 points. According to the scores given to the sub-domains, the most relevant restorative outcomes achieved through this activity were *attention restoration* and *relaxation and calmness* with medium to high values. On the contrary, *clearing one's thoughts* and *reflection* got lower ratings.

Table 3.2.

Restoration Outcomes for walk 1

ROS-S domain	Score
Global score	3.17 (1.25)
<i>Relaxation & Calmness</i>	3.45 (0.93)
<i>Attention Restoration</i>	3.71 (2.81)
<i>Clearing one's thoughts</i>	2.75 (1.03)
<i>Reflection</i>	2.29 (1.45)

Note: 0= Not at all; 1= Very little; 2= A little; 3= Moderately; 4= Much; 5=Absolutely

3.3.2. Results of second walk

Participants reported that they had worked an average of 1.35 ($SD= 4.16$) and 44.08 ($SD= 19.31$) hours respectively the day and week data collection took place. Their pretest score was low for *tension-anxiety*, *depression-dejection*, *anger-hostility* and *fatigue*. *Vigor*, *positive affect* and *happiness* were medium to high. Finally, participants rated their level of *stress* as low. Thus, it can be stated that they showed a good psychological state, supported also by *TMD* index score.

The statistical comparison among pretest and posttest scores revealed significant changes in most of the variables. Walkers got a reduction in *tension-anxiety* and *depression-dejection*. Additionally, they increased their level of *vigor*, *positive affect*, and perceived *happiness*. *Stress* score was also reduced after the walk. The magnitude of the effect sizes for these changes is small for *Vigor*, *Positive Affect* and *Happiness* ($\omega^2= .01-.03$) and medium for *Tension-Anxiety*, *Depression-Dejection* and *Stress* ($\omega^2= .07-.10$). Results of this analysis are shown in Table 3.3.

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Table 3.3.

Pretest-Posttest differences for walk 2

Measure	Pretest	Posttest	F (1,27)	<i>p</i>	ω^2
<i>Tension-Anxiety**</i>	0.71 (0.66)	0.32 (0.49)	11.97	.002	.09
<i>Depression-Dejection**</i>	0.22 (0.31)	0.05 (0.13)	7.80	.009	.10
<i>Anger-Hostility</i>	0.15 (0.33)	0.17 (0.80)	0.02	.877	.01
<i>Fatigue</i>	0.39 (0.51)	0.43 (0.67)	0.07	.792	.01
<i>Vigor***</i>	2.95 (0.66)	3.36 (0.52)	18.29	<.001	.01
<i>TMD **</i>	-1.47 (1.63)	-2.39 (1.44)	10.42	.003	.07
<i>Positive Affect**</i>	2.53 (0.59)	2.75 (0.56)	8.64	.007	.03
<i>Stress*</i>	24.82 (29.49)	10.60 (17.66)	6.43	.017	.07
<i>Happiness **</i>	73.57 (20.13)	81 (16.44)	8.41	.007	.03

Note: mean, standard deviation of walk 2 for pretest and posttest scores, F statistic value, *p* value and ω^2 are referred for each of the variables above. * = *p* value < .05; ** = *p* value < .01; *** = *p* value < .001. *TMD* = Total Mood Disturbance.

As can be seen in Table 3.4, the activity was evaluated as restorative by its participants (average of 3.63/5). Again, *attention restoration* and *relaxation and calmness* where the more relevant achieved outcomes whereas *clearing one's thoughts* and *reflection* got lower scores.

Table 3.4.

Restoration Outcomes for walk 2

ROS-S domain	Score
Global score	3.63 (0.99)
<i>Relaxation & Calmness</i>	3.95 (1.04)
<i>Attention Restoration</i>	3.70 (1.31)
<i>Clearing one's thoughts</i>	3.44 (1.31)
<i>Reflection</i>	3.17 (1.25)

Note: 0= Not at all; 1= Very little; 2= A little; 3= Moderately 4= Much 5=Absolutely

Finally, *ROS-S* scores were compared in order to know whether the two walks got comparable results. Significant differences were found for *Attention Restoration* [$F(1,59) = 5.40; p = .024; \omega^2 < .01$] and *Reflection* [$F(1,59) = 6.820; p = .016; \omega^2 = .09$], indicated that participants of walk two got a greater experience in those terms. The difference in the former is very small whereas in the latter is medium in size.

3.4 Discussion

NW is a walking modality using two poles that effectively stimulates upper and lower body muscles and that has experienced an important spread from Finland to other western countries in the last decades (Lee & Park, 2015; Österlund-Pötzsch, 2013). Evidence gathered to date highlighted its therapeutic value after medical interventions or injuries and its effects on medical health variables. However, as stated in the introduction, much less is known about the psychological outcomes of this activity that may presumably entail important consequences regarding psychological health and well-being. The results of the study showed that, in line with the

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theoretical basis and hypothesis of the study, the practice of NW leads to psychological benefits in terms of reduction of negative affect (walks 1 & 2) and increase of positive affect (walk 2). The sizes of these changes are similar to the ones reported in previous studies on traditional walking (Gidlow et al., 2016; Johansson et al., 2011; Weng & Chiang, 2014). Further evidence to support this statement comes from participant's ROS-S answers, which indicated that the walk allowed them to relax, restore their attention ability, clear their thoughts and reflect in different degrees. This was the first attempt to assess the psychological effects of this kind of activity, and these results are meaningful and promising, showing that further studying NW from this perspective could corroborate its psychological benefits and expand our knowledge on the matter.

From the perspective of leisure and occupational health research traditions, the outcomes are compatible with the role that has been previously assigned to physical activity in the maintenance of health and well-being. In this sense, pretest-posttest comparisons point in the direction of this activity being a good practice to alleviate stress and other psychologically deleterious effects. Additionally, answers to ROS-S indicate that it allowed participants to calm down and restore attentional capacity. In the case of the former, it converges with one of the main defining features of recovery activities, which is relaxation (Sonnentag & Fritz, 2007). Following this line of thought, Nordic walks assessed in this study could have provided participants with detachment from life stressors as well, as the activity and the environments where it took place may not represent the features of the activities or issues leading to stress and emotional fatigue for most people. Finally, even if NW technique is not complicated, it still requires a certain

level of accuracy and therefore requires learning, which also conflues with mastery, which is another option for psychological recovery. This latter reasoning supports the claim of NW being a suitable candidate as a recovery experience.

In regard to research on NW as a whole, this contribution is original since previous studies comprised psychological measures aimed at clinical populations (Lee & Park, 2015; Piotrowicz, Piotrowski, & Piotrowicz, 2016; Strömbeck et al., 2007). This study retakes a line of inquiry initiated three decades ago (Stoughton, 1992) but apparently not continued afterwards. We have evaluated psychological effects of NW in a general population sample and discovered that this activity has positive implications in such a sphere. In addition, regarding research on restoration, this study might be relevant for literature on this topic as it overcame limitations of previous work by including non-university samples, and performing a new activity in both city-centre and urban beaches settings (Subiza-Pérez et al., 2018).

A final consideration can be also made regarding the environments where the walks were performed. Works on green exercise assume that physical activity, when performed in settings more natural than people's daily environments, will lead to greater psychological outcomes (Mackay & Neill, 2010; Pretty et al., 2003). In this study, walk 2 offered a very natural setting, whereas walk 1 went mostly along streets of the city centre with low levels of green elements. Therefore, and considering that both walks caused a positive effect on participant's psychological state, we should contemplate that not only green environments might provide restorative experiences; instead, the only fact of being outdoors may lead to achieve positive

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psychological outcomes from exercise and physical activity²³. In this sense, it is worth recalling those studies where outdoor exercise seemed to offer larger psychological improvements than indoor practice (T. P. Pasanen et al., 2014; Rogerson, Gladwell, Gallagher, & Barton, 2016; Thompson Coon et al., 2011) and those that did not find remarkable differences between environments showing different levels of naturalness (Bodin & Hartig, 2003; Butryn & Furst, 2003; Gidlow et al., 2016; Johansson et al., 2011). It might be that the city where we conducted the study, even in its less green parts, had a very friendly and walkable design (Frank, Schmid, Sallis, Chapman, & Saelens, 2005; Saelens, Sallis, Black, & Chen, 2003) along with a healthy social atmosphere. Thus, our choice of location may not be representative of the average city or urban landscape. Consequently, an emerging question from this work would be the comparison among distinct levels of grey landscape (e.g. varying in walkability, aesthetic value, friendliness, traffic congestion).

Study limitations, future lines of research and study implications

Limitations of this study should also be noted. First, it is well-known that the use of self-reported data when measuring affective states may be impacted by the expectations that participants have about the activity and its psychological outcomes (Buckworth & Dishman, 2002). Second, sample size was limited and the study lacked a control group. As stated by Schweizer & Furley (2016), the use of small samples could lead to an over-estimation of effect size due to the greater vulnerability of strong variations in data. In this sense, we strongly recommend to replicate this study with larger samples to

²³ This reflection is even more remarkable in an era in which the balance between time spent indoors and outdoors is greatly uneven for most people (Hartig et al., 2014).

better calculate the psychological effect of the activity. A self-selection bias may have also occurred as participants were recruited among the walks' attendants. Another point that deserves consideration is that pretest-posttest measures reflected only affective states, so this study cannot inform adequately about cognitive restoration. This should be considered in future work of this research line. Similarly, the inclusion of a wider set of measures will permit us to gather information about NW's influence in other variables (e.g. social outcomes or self-esteem) not included in this study and this would help develop a more holistic and comprehensive understanding of the benefits from NW.

Although it would be difficult to claim that NW does not have the psychological effect of other exercise modalities, results and conclusions here need further replication. Future studies should continue analysing the psychological benefits of NW using larger samples and more complex designs (e.g. within subjects or control groups). Similarly, once the one single session effects were demonstrated, longitudinal studies might be able to assess the long term (or chronic) effects of NW. If these results are replicated and extended, it would be advisable to include this activity in public strategies aimed at developing healthier cities. Moreover, promoting psychologically healthy and socially positive activities in the public space would be a relevant contribution to the development of a more sustainable, inclusive and socially harmonic model of city.



CHAPTER 4 THE RESTORATIVE POTENTIAL OF GROUP OPEN-AIR ACTIVITIES

The content of this chapter is being reviewed for publication in *Leisure Studies* Subiza-Pérez, M., Vozmediano, L., & San Juan, C. Psychological restoration through group open-air activities and its relation with place attachment: a study with healthy late adults.

4.1 Introduction

4.1.1 The value of leisure and Physical Activity for older people

Leisure activities are thought to help recover from stress and other deleterious psychological outcomes coming from job performance, family issues and interpersonal relationships (Iwasaki & Schneider, 2003). Indeed, leisure activities can be seen as active coping strategies that people perform for enjoyment and self-enhancement (Merritt, Zawadzki, Paolo, Kayla, & Ayazi, 2017). Sonnentag and collaborators stated that activities fostering detachment from the stressor source and increasing relaxation feelings may conduce to pre-stressor psychological states (Sonnentag & Fritz, 2007; Sonnentag & Zijlstra, 2006).

A body of literature documents the positive effects of leisure-time physical activity (LTPA) for psychological well-being (Reed & Buck, 2009; Rethorst et al., 2009; Wipfli et al., 2008) at the general population level. In later age, LTPA has been found particularly interesting because it improves health, autonomy and life satisfaction (Grant, 2008; Kim, Lee, Chun, Han, & Heo, 2017; Paillard-Borg, Wang, Winblad, & Fratiglioni, 2009; Sarid, Melzer, Kurz, Shahar, & Ruch, 2010) and may help to reduce the deleterious effects of acute episodes of stress (Chang, 2015).

4.1.2 The Psychology of restoration

These former postulates easily converge with psychological restoration (Korpela & Kinnunen, 2011), a relevant line of research in environmental psychology. Psychological restoration is the process that allows a person to recover the cognitive, emotional and social resources spent in meeting the demands of daily performance (Hartig, 2004). An activity is restorative when

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the person is able to disconnect from daily routine, to focus his/her attention in interesting or fascinating elements, contents or behaviours and to suit his/her willingness. Literature on restoration shows that the main outcomes of this process are the recovery from attentional fatigue and emotional distress and the increase of relaxation and renewal feelings (e.g. positive affect). This conceptual convergence explains the presence of restoration studies in leisure journals (Home et al., 2012; von Lindern, 2015; Von Lindern et al., 2013; Weng & Chiang, 2014; Wöran & Arnberger, 2012).

Field studies on restoration are usually experimental or quasi-experimental designs that collect cognitive and/or affective measures before and after the environmental intervention (e.g. walking in a forest, environment contemplation). Then, the comparison between pre-test and post-test scores allows evaluating the restorative effects of such an intervention. Walking (Gidlow et al., 2016; Johansson et al., 2011), sitting (Tsunetsugu et al., 2013), a mix of both (San Juan, Subiza-Pérez, & Vozmediano, 2017; Tyrväinen et al., 2014) and running (Bodin & Hartig, 2003; Butryn & Furst, 2003) have been the main activities studied to date, generally in natural or green settings. Given this reduced set of activities, authors of a recent review suggested that studying the restorative potential of other kind of activities could be a relevant contribution to this area of research (Subiza-Pérez et al., 2018).

4.1.3 The psychology of place bonding

Environmental psychology also describes that people establish psychological bonds with meaningful places such as the home, the neighborhood or the country. Here we can distinguish two main constructs: place attachment and place identity. Place attachment is an eminently emotional bond towards a

specific place that makes the person feel at ease and seek for proximity (Hernández et al., 2007; Low & Altman, 1992). On the other hand, place identification is a pre-eminently cognitive construct that encompasses the ideas, values, meanings and memories of a place which forms a part of somebody's self or personal identity (Scannell & Gifford, 2010; Uzzell, Pol, & Badenas, 2002). There seems to be an agreement in literature about the idea of place attachment being a predominantly affective or emotional construct whereas place identity is understood as primarily cognitive (Hammitt, Backlund, & Bixler, 2006).

Literature on leisure is rich in studies using place bonding variables to understand recreationist's behaviors, opinions and experiences. When it comes to operationalize these constructs, authors have tended to choose one out of two taxonomic approaches. First one, following Williams, Patterson, Roggenbuck, & Watson, 1992, posits that place attachment is composed by place identity and place dependence (see for example Oh, Lyu, & Hammitt, 2012 and Smith et al., 2010). On the other hand, some authors have picked Hammitt, Backlund and Bixler's proposal (2006) with place attachment being formed by the two former variables plus familiarity, belongingness and rootedness (e.g. Cheng & Chou, 2015; Graefe & Dawson, 2013).

For this work, following previous studies (Casakin et al., 2015; Devine-Wright & Howes, 2010; Hernández et al., 2007; Vidal et al., 2010), place attachment and identification were defined as same-level constructs. In line with those authors, we understand that both variables are different in nature and thus they deserve to be measured independently.

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4.1.4 Study aim

The main objective of this study was to assess the restorative potential of two open-air group leisure activities conducted in the city of Donostia-San Sebastián (Spain) with a non-clinical sample of older adults. The second objective was to test the possible association between the psychological bonding to the activity setting and the restoration achieved when in there. Even though a relevant body of literature on leisure has incorporated place bonding variables, to our knowledge this is the first time that they have been explicitly linked to psychological outcomes of LTPA in the leisure literature.

4.2 Materials and Methods

4.2.1 Sample

The sample was composed by 60 adults, 66.47 ($SD = 7.44$) years old on average of whom 57 indicated their gender as female. All of them were living in the city where the study was conducted. Participants were divided in two sub-groups depending on the activity they joined (activity 1, 34; activity 2, 26). Both groups were comparable in terms of age [$M_1 = 67.44$, $SD_1 = 7.22$; $M_2 = 65.19$, $SD_2 = 7.67$; $t(58) = 1.16$, $p = .249$].

4.2.2. Places and activities description

Both activities, Taichi-Yoga and Gimnastics-Zumba, were conducted in public spaces of the city where the study took place: three beaches and one public square. Both of them were one-hour long sessions directed by an instructor. The participants were placed in consecutive rows looking to the instructor and following his/her indications.

Although similar in length, structure and number of participants, major differences in their nature should be noted. Taichi-Yoga sessions (activity 1) comprised slow and reflexive exercises calmly performed by participants in a tranquil atmosphere. The level of physical exigence of this activity can be defined as low, due to the pace and dynamic. On the other hand, Gimnastics-Zumba sessions (activity 2) required a greater level of physical exigence and performance, as they were faster and much more intense and demanding. Additionally, this activity was accompanied by energetic music.

4. 2.3. Instruments

The questionnaire had an initial brief general section for registering age, gender and psychological bonding with the place where the activities were performed. We measured the latter with an adaptation of the *Place Attachment and Identification Scale* (Ruiz et al., 2011) for specific urban settings (Subiza-Pérez et al., 2017). This scale is composed by 10 items – 7 measuring attachment and 3 measuring identification – and was presented in a 0 to 5 scale (*not at all- totally*).

The pretest and posttest sections comprised the following affective measures:

The Short Spanish version of Profile of Mood States (Andrade et al., 2013) is a list of 25 adjectives describing affective states to be rated in a 0-4 scale (0= *nothing*, to 4 = *a lot*). Those adjectives are grouped in five different dimensions: *tension-anxiety*, *depression-dejection*, *anger-hostility*, *fatigue* and *vigor*. Besides, the subtraction of the *vigor* score to the addition of the other four dimensions allows obtaining a *Total Mood Disturbance* index.

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The Spanish short version of The Positive Affect Schedule (Robles & Páez, 2003) is a list of 10 adjectives on affective states but in this case they belong to a single dimension of *positive affect*. The rating scale used was 0-4 too.

The Overall Stress and Happiness Scales ask participants to rate their actual perceived *happiness* and *stress* using a 0 to 100 scale (van den Berg et al., 2003).

The posttest section of the questionnaire also included the *Spanish Adaptation of the Restoration Outcome Scale (ROS-S)*; Subiza-Pérez et al., 2017). This instrument is composed by 8 items in a 0 to 5 scale covering the main components of a *restorative* experience: *relaxation and calmness*, *attention restoration*, *clearing one's thoughts* and *reflection*.

4.2.4. Procedure

Researchers approached activities' participants one week before the data collection session and informed about the nature of the research and the implications of taking part in it. One week after that, they attended two of the program sessions in order to undertake the collection of the data. Participants filled in the first section of the questionnaire before starting the activity and the other one after finishing it. A schematic display of the design is showed in Figure 4.1. Data collection occurred between June 27th and July the 1st of 2016.

4.2.5 Data analysis

Statistical analyses were planned as follows. A comparison between groups' pretest scores was firstly conducted to check if there were initial differences in the psychological state of participants before doing the activity. Secondly

a repeated measures MANOVA with Bonferroni correction was executed to assess the possible changes in the studied variables. A final statistical contrast between the *ROS-S* scores by activity was conducted too. When statistically significant differences were found, the effect size was calculated using ω^2 for within-subjects and between-subjects designs depending on the nature of the comparison (see figures 2.4 and 2.5, page 93). Finally, correlation analyses (Pearson's *r*) were run in order to check the possible associations of place attachment and identification with the obtained restorative outcomes (*ROS-S*). If positive, a final regression analysis would be done to see whether both variables stay associated to the outcome in the presence of the other one.

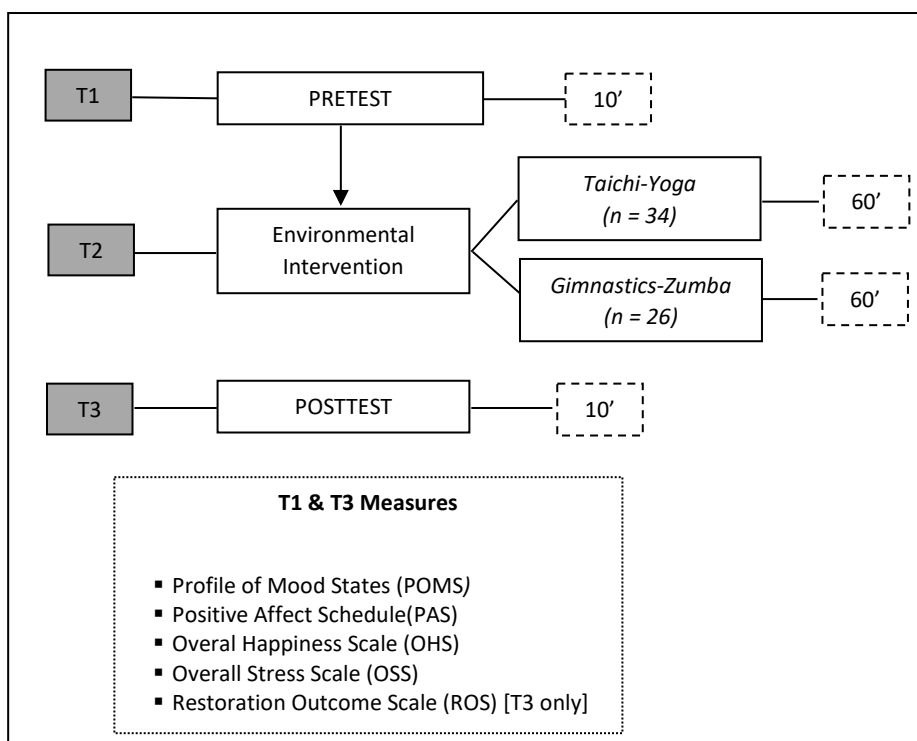


Figure 4.1. Schema of the experimental procedure of this study.

4.3. Results

4.3.1 Initial Psychological State

Table 4.1 shows the pretest and posttest scores for each study variable in both activities. Participants showed low levels of *tension-anxiety*, *depression-dejection*, *anger-hostility*, *fatigue* and stress and medium levels of *vigor* and *positive affect* in the pretest. Total Mood Disturbance (*TMD*) was also low. Additionally, they rated their current level of *happiness* as medium-high.

A MANOVA was run to check whether there were significant differences in the study variables by group before starting the correspondent activity. This test did not reveal any statistical difference between the groups at any study variable except for *happiness*, with participants in activity 2 reporting a lower level of it [$F(1,58) = 4.38; p < .041; \omega^2 = .01$]. Despite this difference – very small in size - , it can be generally stated that both groups were in a similar psychological state before starting the session.

Table 4.1

Pretest-posttest scores by activity

Measure	Activity 1		Activity 2	
	Pretest	Posttest	Pretest	Posttest
<i>Tension-Anxiety [0-4]</i>	0.77(0.63)	0.46(0.56)	0.74 (0.71)	0.54 (0.45)
<i>Depression-Dejection [0-4]</i>	0.45(0.54)	0.27(0.36)	0.38 (0.43)	0.25 (0.39)
<i>Anger-Hostility [0-4]</i>	0.26(0.30)	0.08(0.28)	0.24 (0.42)	0.07 (0.14)
<i>Fatigue [0-4]</i>	0.63(0.49)	0.43(0.44)	0.71 (0.72)	0.78 (0.53)
<i>Vigor [0-4]</i>	2.74(0.58)	2.98(0.58)	2.46 (0.73)	2.96 (0.94)
<i>TMD [0-(-16)]</i>	-0.63 (1.58)	-1.74 (1.29)	-0.40 (1.93)	-1.32 (1.46)
<i>Positive Affect [0-4]</i>	2.32(0.49)	2.53(0.61)	2.26 (0.77)	2.49 (0.85)
<i>Stress [0-100]</i>	21.27(23.60)	12.90(11.30)	22.64 (21.49)	12.43(10.64)
<i>Happiness [0-100]</i>	74.77(18.68)	84.76(6.68)	63.64 (22.47)	71.32(19.48)

Note: mean, standard deviation for pretest and posttest scores for each of the variables included in the field questionnaire for both activities *TMD* = Total Mood Disturbance

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4.3.2 Affective restoration gained through the activities

Results indicated an effect of *Time* in most study variables with significant decreases for *Tension-Anxiety* [$F(1,58) = 6.93; p = .011; \omega^2 = .04$], *Depression-Dejection* [$F(1,58) = 6.81; p = .011; \omega^2 = .02$], *Anger-Hostility* [$F(1,58) = 13.64; p < .001; \omega^2 = .07$], *TMD* [$F(1,58) = 21.03; p < .001; \omega^2 = .09$] and *Stress* [$F(1,58) = 12.44; p = .001; \omega^2 = .06$]. In the same line, the activities prompted a significant increase in *Vigor* [$F(1,58) = 16.07; p < .001; \omega^2 = .06$], *Positive Affect* [$F(1,58) = 8.49; p = .005; \omega^2 = .02$] and *Happiness* [$F(1,58) = 12.23; p = .001; \omega^2 = .06$]. All these effect sizes were medium but for *Depression-Dejection* and *Positive Affect*, which were small.

4.3.3 Achievement of Restorative Outcomes by activity

As stated in the Methods section of this paper, *ROS-S* allows to measure four of the key features of a restorative experience. Table 4.2 displays the scores for each activity. At first glance, considering the rating scale of the items, both activities were rated as quite restorative (3.38 and 3.46 out of 5). In activity 1, the most achieved outcomes were *clearing one's thoughts* and *relaxation & calmness*, whereas *attention restoration* and *reflection* got lower ratings. A similar pattern was observed in activity 2. Global and domains' ratings by type of activity were compared using MANOVA, without detecting any significant difference in any of them.

Table 4.2.

Restoration outcomes by type of activity

ROS domain	Activity 1	Activity 2
<i>Relaxation & Calmness</i>	3.62(0.85)	3.85(0.82)
<i>Attention Restoration</i>	3.19(1.17)	3.52(0.96)
<i>Clearing one's thoughts</i>	3.66(1.03)	3.75(0.98)
<i>Reflection</i>	2.83(1.20)	2.58(1.26)
Global score	3.38(0.89)	3.46(0.79)

Note: 0= Not at all; 1= Very little; 2= A little; 3= Moderately; 4= Much; 5=Absolutely

4.3.4 Correlations between place-bonding variables and restorative outcomes

Both place attachment and place identification were significantly associated to the restoration achieved by participants ($r = .475, p < .01$ and $r = .311, p < .05$ respectively). The subsequent regression model to predict experienced restoration (ROS-S) through attachment and identification scores resulted significant [$F(2,59) = 8.30; p < .001$] and explained a 20% of the variance in the outcome variable. The association of attachment remained significant ($\beta = 0.46; t = 3.08; p = .03$) but identification's link to restoration did not ($\beta = 0.02; t = 0.15; p = .88$).

4.4 Discussion

The main objective of this study was to assess the restorative potential of two recreational group-open air activities conducted by a sample of older adults. To do so, pretest and posttest measures of participants' mood states were taken. Overall, results showed an increase in several variables included in the study. Attendants to the activities reduced their Tension-*anxiety*, *depression-dejection*, *anger-hostility*, *TMD* and *Stress* and increased their *vigor*, *positive affect* and *perceived happiness*. Additionally, answers to *ROS-S* indicated that both activities were perceived as moderately restorative, with ratings from 2.58 to 3.85 in a 0 to 5 scale. Together, these facts support the conclusion that the group open-air activities studied here provided participants with a restorative experience. These results go in line with a study showing that active elderly adults enrolling organized LTPA group activities had better health than their less active counterparts (Gagliardi, Spazzafumo, Papa, & Marcellini, 2012). In the light of the results showed here, group open-air activities might be seen as little pills to keep and promote well-being in the healthy elderly.

The second objective of the study was to check the possible association of place attachment and place identity with restoration. To the knowledge of the authors, this was the first study in leisure literature linking place bonding to the psychological benefits of leisure activities. Results obtained here provisionally indicate that the more emotionally attached a person is towards a specific recreation setting, the more psychological restoration (s)he gets when there. This link could not be confirmed for the case of place identification. Globally speaking, this may inform about the value of personal ties with places in the obtention of psychological benefits

when visiting them, as it has been shown in recent publications (Ratcliffe & Korpela, 2016; Scannell & Gifford, 2017b). In the applied sphere, these results might be useful for health and leisure institutions and practitioners. Placing their interventions in meaningful settings would help to increase their positive psychological effects.

4.4.1 Limitations and future lines of research

The study presented in this paper presents some limitations that must be acknowledged. The relatively small sample size invites to consider its results with caution. Maybe due to the difficulty of getting large samples for restoration pretest-posttest studies, reduced samples are not uncommon in this area of research (Berman et al., 2008; Butryn & Furst, 2003; Kerr et al., 2006; Takayama et al., 2014). Additionally, the inter-subject design invites to replicate these findings with more robust designs. Secondly, it may be argued that participants were not in a great restoration need, nevertheless, even in that state, both activities led to a psychological improvement. Indeed, this is a direct consequence of the authors' bet for an ecological approach that consisted on working without a previous fatiguing or stressing task (for examples in literature please see Gatersleben & Andrews, 2013 or Hartig et al., 2003). This way, scores reflected the actual mood of this sample of healthy and active elderly adults and we were able to isolate the effect of the activities on participants' daily mood. In spite of these limitations, authors consider that this work is a valuable contribution in the leisure and restoration research agenda. An agenda that might bring interesting developments in the theoretical and applied spheres in the following years and that could result in relevant impacts to people's health and well-being.

BLOCK 2
THE RELATIONS BETWEEN PLACE
BONDING AND PSYCHOLOGICAL
RESTORATION



CHAPTER 5 INSTRUMENTS ADAPTATION AND PRELIMINARY EXPLORATION OF THE RELATIONSHIP BETWEEN PLACE BONDING AND RESTORATION

A significant part of the content of this chapter has been published in Subiza-Pérez, M., Vozmediano, L., & San Juan, C. (2017). Restoration in urban settings: pilot adaptation and psychometric properties of two psychological restoration and place bonding scales. *Psychology*, 8(2), 234–255. <http://doi.org/10.1080/21711976.2017.1311073>

5.1 Introduction

5.1.1 Restoration and place attachment

Attention restoration theory

Attention Restoration Theory (ART, Kaplan, 1995; Kaplan & Kaplan, 1989) proposes that coming into contact with spaces that allow individuals to remove themselves from their everyday contexts — spaces that are rich in organized content, are aesthetically pleasing and interesting and align with the needs and personal inclinations of the individual — will allow them to recover from attention fatigue resulting from everyday activity.

According to these authors, the restorative experience is divided into four consecutive phases, which would be progressively achieved depending on the length of time spent and the restorative potential of the surroundings (Kaplan & Kaplan, 1989, pp. 196–7). The first phase involves erasing the cognitive waste generated by activities carried out previously, thus ‘cleansing’ the mind. The second would entail the recovery of cognitive resources used in the maintenance of sustained attention, which have been diminished by prior usage. Following the above two stages, an individual would be able to pay attention to matters and mental contents that might previously have gone unnoticed in their everyday activity, and which could be of importance in their psychological functioning and wellbeing. The last stage of this experience, having recovered from mental fatigue and recovered an adequate cognitive and emotional state, would lead the individual to reflect on his/her own actions, goals, life and place in the world. In subsequent publications (Herzog et al., 1997; Herzog, Maguire, & Nebel, 2003), these four stages were summarized under two major headings: attention restoration (stages 1 and 2) and reflection (stages 3 and 4).

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Today, a substantial volume of evidence supports the basic postulates of ART with regard to the stages of attention restoration (see for example Berto, 2005; Bowler et al., 2010; Hartig et al., 2003; Korpela et al., 2010; Tyrväinen et al., 2014). Hence, we know that restorative spaces (RS) facilitate the recovery of attention resources and their emotional derivatives (tiredness, stress, anxiety, hostility, etc.), and this evidence empirically corroborates the first two stages of restoration as they were originally presented. However, the analysis of academic literature about RS quickly reveals that very little effort has been dedicated to studying the reflective stages, and there is currently insufficient evidence to ratify the most existential and transcendent part of this psychological phenomenon.

Person-place bonds

Environmental Psychology has also dedicated a great deal of research to studying the bonds established by people with places, distinguishing two important constructs: attachment and identification. In its classic definition, place attachment is a bond formed by people towards places (Low & Altman, 1992). In subsequent publications, it has been presented as a markedly emotional tie established by people with spaces or places that are significant to them, where they feel comfortable and secure, and towards which they try to maintain a certain proximity (Hernández et al., 2007; Hidalgo & Hernández, 2001). These places, as is also the case with interpersonal attachment, could be used as a safe haven in the face of threats or stressful events, and would also provide a basis for exploration (Scannell & Gifford, 2014). Similarly, forced separation (due to natural disasters or war, for example) would produce feelings of stress and anxiety.

Although attachment can be developed towards places on a wide variety of scales, from a single room to the whole world (Lewicka, 2011b; Seamon, 2014), the vast majority of studies conducted to date have focused on the home, neighbourhood or community, and city. Much less research, however, has examined attachment to specific places, although some studies have analysed attachment to natural parks (Wynveen, Kyle, & Sutton, 2012), city parks (Main, 2013) or recreational areas (Madgin, Bradley, & Hastings, 2016).

Identification with a place, on the other hand, would be the definition of the self derived from one's experience with places (Scannell & Gifford, 2010), which would appear when a feeling of belonging to a place develops and this feeling becomes a part of an individual's personal self-concept. The work of Valera and Pol on urban social identity encompasses the idea that certain urban spaces are part of the social identity of people and groups, as scenarios in which identity is symbolically constructed and used therefore in processes of categorization and social differentiation (Valera & Pol, 1994). In addition to supporting certain previous social identities, the feeling of belonging or affiliation to a certain space would also shape a social identity in itself (Valera, 1996), which in this case would be spatial.

The relationship between restoration and place attachment

As explained in the introduction of this thesis dissertation (see pages 38-43), one of the objectives of this work was to test the association between place bonding and restoration beyond the Environmental Self- Regulation Hypothesis (Korpela & Hartig, 1996; Korpela et al., 2008). This is, in line with

recent studies, to test whether people more bonded to a specific place obtain more restorative outcomes when visiting it than less bonded people.

5.1.2 Instruments to measure restoration and place attachment

Restoration outcome scale

The Restoration Outcome Scale (*ROS*) was developed by Korpela and collaborators to evaluate the magnitude of restorative experience (Korpela et al., 2008, 2010). The short version includes six items scored using a Likert-type scale (0–6), and reflects three components of restorative experiences: relaxation and calm (items 1, 2 and 3), attention restoration (item 4) and the ‘cleansing of thoughts’ (items 5 and 6). It was designed to be used in surveys conducted to evaluate the degree of restoration attained by individuals when visiting any of their everyday places, since in this context it is not possible to take pre-test and post-test measurements characteristic of field studies (see, for example, Park, et al., 2010; Tsunetsugu et al., 2013). This is precisely where its main interest lies, since it can be used in surveys conducted on larger samples, which would also reveal the long-term effects of contact with *restorative places* and their relationship with more ‘macro’ type health and social variables (Hartig, Mitchell, de Vries, & Frumkin, 2014).

On occasions, when studies have been conducted to ascertain the restorative potential of different urban or natural spaces (Bratman et al., 2012; Chang, Hammitt, Chen, Machnik, & Su, 2008; Hidalgo, Berto, Galindo, & Getrevi, 2006; Troffa & Fornara, 2011), the Perceived Restoration Scale (PRS) developed originally by Hartig et al (1997) has been used. The PRS asks respondents to express the degree to which they consider a certain space to fulfil the defining characteristics of restorative spaces. Owing to its nature

and approach, this scale does not, from an epistemological perspective, appear to be the most adequate for evaluating the real restoration obtained when relating with said spaces. The ROS, on the other hand, by asking about the benefits obtained following contact with a certain space, could suit this purpose better.

Furthermore, within the context of field studies, the authors feel that this measure, which is simple and easy to use, could complement traditionally used measures (affective state and cognitive performance) and in turn could reflect constitutive elements of the restoration experience that cannot be evaluated by traditional measures (for example, cleansing of thoughts). This scale has been recently used in this way (Gidlow et al., 2016; Takayama et al., 2014; Tyrväinen et al., 2014).

Attachment and identification scale

Ruiz et al. (2011) developed a scale to measure attachment and identification with a neighbourhood. The short pared-down version contains a total of nine items scored using a Likert-type scale ranging from 1 to 6. The Attachment factor is measured through six of these items, and Identification through the other three. The scale offers good reliability and psychometric validity indicators, and it has been used to measure attachment with different spatial units such as neighbourhoods, cities, towns and even islands (Casakin et al., 2015; Hernández et al., 2007; Hernández, Martín, Ruiz, & Hidalgo, 2010; Ruiz et al., 2013).

5.1.3 Research goals

The research presented here pursues four main goals: (1) to adapt the Restoration Outcome Scale into Spanish; (2) to adapt the Attachment and

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Identification Scale to be used in reference to specific urban spaces; (3) to ratify whether both versions offer adequate reliability and 4) conduct a preliminary study on the relationship between psychological bonding and restoration in open urban places.

5.2 Method

5.2.1 Participants

A total of 170 people took part in this research, ranging in age from 18 to 63 ($M = 33.82$; $SD = 12.01$). The sample included 115 women (67.65%). The participants lived in different towns and cities around Spain, and the average length of time lived in the locality was 21.17 years ($SD = 15.82$).

5.2.2 Adaptation of instruments

In order to adapt the ROS, two researchers with proven expertise in this field and advanced knowledge of English (C1) separately translated the items into Spanish. Having compared the two initial translations and discussed the details, they agreed on a final version, which was given to a psychologist and an English professor for back translation. The two versions in English were compared and contrasted, and no differences were found between them, maintaining the sense and meaning of the original in the back translation. Finally, two items were added referring to the existential or reflective stage of restoration (items 7 and 8), devised by the authors of this paper. Table 5.1 shows the original items of the ROS, their adaptation into Spanish and the two additional items.

Table 5.1.

Original ROS items and their adaptation to Spanish

1. I feel calmer after being here	1. Después de estar aquí me siento más tranquilo/a
2. After visiting this place I always feel restored and relaxed	2. Tras visitar este lugar siempre me siento renovado/a y relajado/a
3. I get new enthusiasm and energy for my everyday routines from here	3. Estando aquí consigo nuevos ánimos y energías para volver a mis rutinas diarias
4. My concentration and alertness clearly increase here	4. Después de estar en este lugar, mi capacidad de concentración se incrementa
5. I can forget everyday worries here	5. Aquí puedo olvidar mis preocupaciones cotidianas
6. Visiting here is a way of clearing and clarifying my thoughts	6. Venir aquí es una forma de despejar y aclarar mis pensamientos
	7. En este lugar tomo distancia de las cosas que me suceden y las veo desde una nueva perspectiva
	8. Aquí suelo pensar acerca de mis prioridades y objetivos en la vida

Note: Items number 7 and 8 were added to the original scale by the authors of this text.

The adaptation of the Attachment and Identification Scale — originally in Spanish — was easier, since it was simply a case of adapting the items to be used with regard to specific urban spaces, a task carried out by the authors. The main change was the replacement of terms such as *live* and *move* (referring to the neighbourhood) with others referring to the use of specific public spaces, such as *come* and *return*. A new item was added to the attachment subscale regarding the sense of security and comfort experienced in the place (item 7), devised by the authors. The original items from the Attachment and Identification Scale, and our proposal for specific urban spaces, are shown in Table 5.2.

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Table 5.2.

Original Attachment and Identification items and their adaptation to Spanish

1. Me gusta vivir en este barrio	1. Me gusta venir a este lugar
2. Lamentaría tener que mudarme a otro barrio	2. Lamentaría no poder venir a este lugar
3. Cuando llevo tiempo fuera, tengo ganas de volver	3. Cuando llevo un tiempo sin venir, tengo ganas de volver
4. Cuando estoy fuera, echo de menos este barrio	4. Cuando llevo un tiempo sin venir, echo de menos este lugar
5. Este es mi barrio favorito para vivir	5. Este es mi lugar favorito para venir a pasar un rato
6. Cuando estoy lejos, me alegra volver	6. Cuando estoy lejos, me alegra volver a este lugar
	7. En este lugar me siento cómodo/a y seguro/a
7. Este barrio forma parte de mi identidad	8. Este lugar forma parte de mi identidad
8. Siento que pertenezco a este barrio	9. Siento que pertenezco a este lugar
9. Siento que soy de este barrio	10. Siento que soy de este lugar

Note: Item number 7 was added to the original scale by the authors of this text.

Once the two scales had been adapted, the questionnaire to be used in the research was designed, divided into two different sections. The first reflected basic socio-demographic variables (age, gender, place of birth and residence and number of years living in current place of residence).

The second section asked informants to refer three different places of the city they lived in; one they liked, one they disliked and one they did not like nor dislike. They informed about places they frequently used in their daily life. They were asked for the name, type, location and distance from those places to their home. Subsequently, the adapted versions of the ROS and the Place Attachment and Identification scales (Likert 0–5) were

presented in reference to those chosen places.

5.2.3 Procedure

An online version of the questionnaire was created using the application Google Forms, which was subsequently sent out via e-mail to personal and professional contacts, free-time associates and other contacts. The snowballing technique was used, asking recipients of the survey to forward it to their contacts, thus facilitating access to a more heterogeneous sample than the university students normally used. The survey was available throughout the month of March 2016.

5.2.4 Statistical analysis

Firstly, answers and ratings of respondents were descriptively assessed. The distribution of place typologies along the three reported places (liked, not liked nor disliked and not liked) was then evaluated through chi-squared analysis. Secondly, the reliability of each scale (by place category) was calculated and scores by place were compared with Repeated Measures MANOVA using Bonferroni correction. Finally, in order to explore the relationship between the study variables, correlation and linear regression analyses were conducted based on the theoretical foundations set out in the theoretical introduction to this chapter.

5.3 Results

5.3.1 Analysis of the chosen places and reliability of the scales proposed

Table 5.3 shows the distribution of place typologies per place category. Chi-squared analysis revealed that they were not equally distributed [$\chi^2(12) = 168.36$; $p < .001$]. Streets were more commonly reported as *not liked nor*

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disliked and *disliked* places. Squares were underrepresented in the liked category and, on the contrary, overrepresented in the *not liked nor disliked*. Parks were more likely reported in the *liked* category and less so in the two other ones and the same happened to viewpoints and promenades. Finally, historical places were more reported than expected in the *liked* places category.

ROS-S, attachment and identity scales got very good level of internal consistency – Cronbach's α - (ROS-S: .91, .95 and .96; *place attachment scale*: .89, .90 and .93; *place identification*: .92, .95 and .93). Scores for each place category were compared using a repeated measures MANOVA with Bonferroni correction. Statistically significant differences were found in the three variables of the study. Table 5.4 and Figure 5.1 show the descriptive scores and results of this analysis. Post-hoc analyses revealed that place 1 got larger scores than places 2 and 3 in all the three variables. Similarly, ratings for place 2 were significantly larger than the ones for place 3 too.

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Table 5.3.

Place category per reported place

Place typology	Place category		
	P1 <i>(Liked)</i>	P2 <i>(Not liked nor disliked)</i>	P3 <i>(Not liked)</i>
Street	9 (5.3)	49 (28.8)	66 (39.1)
Square	18 (10.6)	68 (40)	28 (16.6)
Park	46 (27.1)	22 (12.9)	14 (8.3)
Viewpoint	17 (10)	1 (0.6)	1 (0.6)
Historical place	8 (4.7)	3 (1.8)	3 (1.8)
Promenade	46 (27.1)	18 (10.6)	17 (10.1)
Other	26 (15.3)	9 (5.3)	40 (23.7)

Note: numbers between brackets indicate the percentage of responses ascribed to each place category within the kind of reported place.

Table 5.4.

Mean score and standard deviation of scales included in the on-line questionnaire by place and repeated measures ANOVA results.

	Place 1	Place 2	Place 3	F (1,168)	p
<i>Place attachment [0-5]</i>	3.34 (0.95)	1.52 (0.95)	0.47 (0.79)	694.29	<.001
<i>Place identification [0-5]</i>	2.31 (1.47)	1.26 (1.30)	0.45 (0.87)	259.19	<.001
<i>Experienced restoration [0-5]</i>	3.09 (1.02)	1.71 (1.61)	0.53 (1.19)	505.58	<.001

5.3.2 Relationship between place bonding and restoration

In order to explore the relationship between place bonding and reported restoration, a correlation analysis was conducted between the two scores, using Pearson's r statistic. Moderate and large correlations were found between place attachment and restoration ($r_{p1} = .588, p < .01, r_{p2} = .727, p < .01$ and $r_{p3} = .842, p < .01$) and between place identification and restoration ($r_{p1} = .439, p < .01, r_{p2} = .356, p < .01$ and $r_{p3} = .575, p < .01$). For informative purposes, the correlation between place attachment and place identification was $.589 (p < .01)$ for place 1, $.623, (p < .01)$ for place 2 and $.715, (p < .01)$ for place 3.

Secondly, having confirmed that the residuals satisfactorily fulfilled the assumptions of normality, independence and linearity, a set of simple linear regression was conducted to ascertain whether the scores of Attachment and Identification could predict restoration ratings for each of the places. Table 5.5 shows the regression models and main coefficients of these analyses. All the models were significant and explained relevant amounts of the variance in the ROS scores (35-71%). Place attachment resulted in a significant predictor of restoration in the three models with betas between 0.50 and 0.83. Place identification was a significant predictor only in Model 2, with a beta of -0.16. It showed a positive tendency in Model 1 and negative one in Model 3 although it did not reach the significance level.

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Table 5.5.

Regression models to predict restoration with place bonding variables

Model variables	P1 -Restoration-					P2 -Restoration-					P3 -Restoration-				
	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Place att.	0.54	0.08	0.50	6.57	< .001	1.40	0.11	0.83	12.33	< .001	1.33	0.09	0.82	14.74	< .001
Place id.	0.10	0.05	0.14	1.84	.067	-0.20	0.08	-0.16	-2.35	.020	-0.08	0.08	-0.06	-0.94	.351
Model statistics															
F	46.64					99.09					203.18				
Degrees of freedom	2, 169					2, 169					2, 169				
<i>p</i>	< .001					< .001					< .001				
Adjusted R ²	.35					.54					.71				

Note: β ,= standarized regression coefficient. Durbin-Watson: 2.21, 2.35 and 1.92 respectively.

5.4 Discussion

5.4.1 Scales adaptation

The main contribution of this study is, in the view of its authors, the adaptation of the Restoration Outcome Scale. This brief scale is useful for evaluating the restoration obtained when coming into contact with a space, through surveys and field studies (Gidlow et al., 2016; Korpela et al., 2008, 2010; Takayama et al., 2014; Tyrväinen et al., 2014). Furthermore, the Spanish version presented here includes two new items aimed at evaluating the reflective phase of the restorative experience, and provides at least an initial approach to measuring this aspect, which has been somewhat neglected thus far. In the proposed version, the scale obtained adequate reliability indices (Cronbach's alpha above .91). Secondly, the adaptation of the Attachment and Identification Scale for use in specific urban settings could also be a significant contribution to further our knowledge of attachment to places like streets, squares, indoor settings or buildings. In spite of the theoretical backing available (Lewicka, 2010, 2011a; Valera, 1996; Valera & Pol, 1994), very little research has examined this (Madgin et al., 2016; Main, 2013; Wynveen et al., 2012), and this instrument could begin to fill this gap. The resulting version of the scale developed in this study, with one item added to measure feelings of security and comfort in use, has also obtained adequate reliability indices, thus offering a useful tool in subsequent research.

Additionally, following the expected relationship between place bonding and restoration, the percentage of restoration variance explained by place bonding (place attachment mostly) is notable. The magnitude and nature of this relationship could be conditioned, at least to some extent, by

the methodology used, given that the participants freely chose three place places and responded based on their memories of experiences in them. Future studies, applying an experimental methodology and different scenarios, and reflecting the restoration actually experienced instead of remembered, could nuance these results and help to adjust the magnitude of the relationship between the studied variables.

5.4.2 Restoration and place bonding results

Regarding the obtained data itself, this study allows to extract some conclusions. First, we discovered that some place typologies, such as parks and promenades, were more likely to define liked places for the sample of participants. On the contrary, streets were the more common reported urban typology when referring disliked places. Squares were the most reported place typology for *not liked nor disliked places*, having a less relevant presence in the two other categories. Secondly, remarkable differences in the psychological benefits and in the magnitude of the psychological ties with places varying in the degree of liking were found.

Another relevant finding is the ascertainment of the moderate levels of restoration and place bonding reported by participants when being in urban settings they liked. In the case of the psychological ties with them, it is not surprising to find moderate scores for open urban places, due to the fact that place bonding seems to function in an inverted U-shape. In words of professor Lewicka, “this curvilinear relationship means that emotional attachment to more extreme scales of place, like home and city is higher than to the midpoints of the scale” (Lewicka, 2010, p.36; see also Bernardo & Palma-Oliveira, 2013, 2016; Hernández et al., 2007; Hidalgo & Hernández, 2001). Thus, settings as parks, squares and streets will fall in the middle of

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the scale continuum and foster intermediate levels of attachment and identification. However, the restoration scores may trigger more doubts and questions. One might expect that the place people reported as *one they liked* – probably their favorite- would get larger ratings, closer to the upper limit of the scale. However, they get moderate scores ($M = 3.09$, $SD = 1.02$). One possible explanation is the very fact that urban settings tend to get lower ratings when assessing landscape preferences and restorative potential (Kaplan & Kaplan, 1989; Lothian, 2017; Ulrich, 1981; Ulrich et al., 1991). Nevertheless, it may be too that scales developed to study restoration when in natural places are not as suitable to do so in urban or built settings. Restoration in natural settings is often understood as a result of walking and contemplating nature alone or with few people, in an atmosphere of calmness and tranquility and in a low-demanding environment. Psychological experience of open urban places might not meet these features and thus cause a different restoration pattern. Indeed, in a work by Thwaites and collaborators (Thwaites, Simkins, & Mathers, 2011, p.28) , they differentiate between the classic nature restoration –relax and recovery- and the one obtained from dynamic and active urban places –social restoration; self-esteem, participation, social engagement-. If the latter is true, using traditional restoration measures to study restoration in urban environments might lead to a poor understanding of the psychological benefits of the use of such settings. Hence, the development of a deeper understanding of urban restoration and the improvement of measurement are of particular interest for this area of research.

Finally, and in spite of the former, evidence from this study point at the strong relationship between place bonding and psychological

restoration. The cross-sectional design of this study do not allow to formulate causal explanations and invites to replicate this results with more complex designs allowing to do so. However so far, this study exhorts to explore this line of query more profusely.

5.4.3 Study limitations and future lines

The study presented here is a pilot study, and as such it has several limitations. Although its online dissemination allowed us to reach a more varied and ecological population than is usually accessed with a university sample, the sample size is nonetheless small for an adequate psychometric study, and therefore, further studies should be conducted on a larger scale. Be that as it may, in the case of the Attachment and Identification scale, the authors have not found any reasons at a theoretical level as to why it would not operate in a similar way as to when it has been used to measure neighbourhood attachment. Confirmatory factor analyses to check that the presented versions show the same structure than the original ones are also needed.

In short, referring back to the title of the article, the versions presented here could be used in studies to examine in greater depth one of the greatest challenges that Environmental Psychology faces today (Lorenzo, Corraliza, Collado, & Sevillano, 2016; Staats et al., 2016): the study of restoration in urban settings. At a time when the population is increasingly concentrated in towns and cities, such spaces have to be reconsidered and designed in terms of wellbeing, restoration and quality of life, always with a view to turning them into a better ecosystem for human life. The traditional response from Environmental Psychology, which has been to encourage contact with nature, must now be nuanced with at least two considerations.

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On the one hand, travelling to natural enclaves during free time has a dual environmental cost: one derived from the travel itself, and the other from the uses made of the spaces visited, which are often not respectful. In addition, this dynamic requires certain economic and social resources that are not present in all sectors of the population. Hence, the constitution of networks of restorative spaces within towns and cities themselves would allow the whole population to enjoy restorative experiences, with a much lower environmental impact and with no financial, economic, social or demographic barriers. The unquestionable right to a restorative urban environment is the principle underlying the modest proposal of this article.



CHAPTER 6

THE ROLE OF PLACE ATTACHEMENT AND IDENTIFICATION IN LANDSCAPE PREFERENCE AND INFERRED RESTORATIVENESS

The content of this chapter is being reviewed for publication in *Journal of Environmental Psychology*: Menatti, L., Subiza-Pérez, M., Villalpando, A., Vozmediano, L., & San Juan, C. Place attachment and identification as predictors of landscape restorativeness: a study with landscape photographs.

6.1. Introduction

This paper presents a study aimed at relating the psychological research on restorative environments to the psychological bonding to places. The novelty of this research lies in the consideration of the role played by two personal variables—place attachment and place identification—in the evaluation of the restorative value of landscapes.

According to the European Landscape Convention, a landscape is: “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors” (Council of Europe, 2000: Article I, Definitions). It is also: “an important part of the quality of life for people everywhere: in urban areas and in the countryside, in degraded areas as well as in areas of high quality, in areas recognized as being of outstanding beauty as well as everyday areas” (Council of Europe, 2000: Preamble; see also Article 2, Scope). Landscapes have been analysed from the perspective of humanities and cultural geography (Berque, 1995; Cosgrove, 1984; Jackson, 1984; Roger, 1997); ecological psychology and the cognitive sciences (Heft, 2010; Heras-Escribano & de Pinedo-García, 2018), health and medicine (Menatti & Casado da Rocha, 2016); the relationship with ecology (Gobster, Nassauer, Daniel, & Fry, 2007) and political concepts such as the idea of commons (Menatti, 2017; Olwig, 2002; Olwig, 1996).

In this paper, instead of considering the restorative and salutogenic values of landscapes as determined only by objective characteristics of landscapes, we argue that they are related as well to the social and personal background of the perceiver.

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6.1.1 Evolutionary-based approaches to the perception of landscapes

Landscape preferences have been usually defined and operationalized as overall judgements of attractiveness, aesthetics or scenic quality (Galindo & Hidalgo, 2005; Purcell, Lamb, Mainardi Peron, & Falchero, 1994). Several evolutionary-based theories have attempted to explain environmental preferences through diverse potential features of natural environments. These are relevant approaches for studying not only the perception of landscapes but also evaluating the benefits obtained from the contact and interaction with them (Lothian, 2017).

The theory proposed by Appleton (1975) argues that, starting from hunters, landscape preferences are influenced by prospects and refuges which allow human beings to be protected and survive. Likewise, the savannah hypothesis (Falk & Balling, 2010; Orians & Heerwagen, 1992) specifies that, like the hominids in the African savannah, human beings transversally continue to prefer open, mildly flat landscapes (savannah-like settings), with water directly in view and a clear way to both avoid predators and to keep an eye on them. Furthermore, Dutton specifies that landscape preferences are innate and universal, arguing that: “people in very different cultures around the world gravitate toward the same general type of representation: a landscape with trees and open areas, water, figures, and animals” (Dutton, 2009, p. 14).

Environmental psychology also follows an evolutionary based approach in analyzing the restorative potential of landscapes. Restorativeness is the ability of certain environments to help people to recover from attentional fatigue and emotional distress. Attention Restoration Theory (ART, Kaplan & Kaplan, 1989), Stress Recovery Theory

(SRT, Ulrich, 1983; Ulrich et al., 1991) and the biophilia hypothesis (Kellert & Wilson, 1993)²⁴ resort to evolutionary arguments to explain psychological restoration. They propose that psychological restoration is the result of entering into contact with landscape features conducive to human survival (e.g. trees or water).

Landscape preference studies based on biological evolution and universal mechanisms often underestimate the role of the personal, social and cultural variables involved in the perceptual and evaluation process. We will address this issue in the following section.

6.1.2 Limits of the evolutionary-based approaches to the perception of landscapes

Evolutionary approaches to the perception of landscapes and to the human-landscape relationship have been questioned both in humanities and psychology.

By following Menatti and Casado da Rocha (2016) we can raise three main critiques to the evolutionary explanations: 1) they cannot be actually demonstrated, 2) they rely on *ad hoc* hypotheses to explain specific situations and, 3) they underestimate the role of cultural and sociological elements. This criticism goes in line with the claims by David Buller (2009) who, writing about evolutionary psychology, stated that some of its

²⁴These theories are the three main frameworks explaining the salutogenic properties of landscapes (Capaldi et al., 2015).

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postulates²⁵ may go too far away from the evidence to date and the current methods and techniques.

Complementary limitations have been pointed out in the field of psychological restoration as well. The works by Joye and collaborators have consistently highlighted the mismatch between the specificity of restorative responses towards food/shelter-providing natural elements – as suggested by the restoration theories- and the general positive psychological effect of the exposition to natural elements reported by the scientific literature (Joye & de Block, 2011; Joye & Dewitte, 2018; Joye & van den Berg, 2011). The evolutionary-based premises of the restoration theories would fail here at explaining the restorative effects of current urban parks, indoor plants or green roofs.

Some authors have tried to complement these approaches to the perception of landscapes and the processes of psychological restoration with other strategies. Wilkie and Stavridou (2013) included in their design a measure of environmental preference and found a different pattern in the perception of restorativeness for nature and urban settings in country and city oriented people. Hagerhäll and colleagues used a sample partially composed by indigenous populations to test the possible effects of culture (e.g. western vs non-western) in the preference for natural landscapes (Hägerhäll et al., 2018). The evidence they got did not match the assumptions

²⁵ The author states that in the current state of science, it is almost impossible to accurately describe the specific adaptive challenges that drove human mental evolution (e.g. the development of psychological traits). Hence, the field is likely to incur in speculation.

of the savannah hypothesis. Other authors have also highlighted the general oversight of cultural variables in this respect (Qureshi, Breuste, & Jim, 2013). These criticisms find support in works in humanities and geography, which consider that landscape preferences and experiences are contextual to people, social groups, cultures and history (Berque, 1995; Cosgrove, 1984; Jackson, 1984).

Ratcliffe and Korpela (2016, 2017) have recently proposed to include personal and psychological variables in the study of restoration. The inclusion of such variables enables the consideration of possible top-down processes, and subsequently may result in a better comprehension of landscape preferences and restorative experiences.

6.1.3 The role of place attachment and identification in the perception and the experience of landscapes

Psychological bonding variables might be a good candidate to enrich studies on psychological restoration and on the perception of landscapes. The geographical concept of topophilia as elaborated by Tuan – “the affective bond between people and place or setting” – has been studied in connection with health and well-being, meaning that individual preferences for specific places and restorative environments are significantly associated with quality of life (Ogunseitan, 2005; Ruan & Hogben, 2007).

The literature on psychological bonding with places recognizes two main constructs: place attachment and place identification. Place attachment is a person-place emotional bond that people establish with significant places, that is, places they visit or use regularly and make them feel at ease (Hernández et al., 2007; Hidalgo & Hernández, 2001; Low & Altman, 1992). On the other hand, place identification is the sense of

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belonging to a place which forms part of the self-concept and that specifies personal and social identities (Scannell & Gifford, 2010; Uzzell, Pol, & Badenas, 2002; Valera & Pol, 1994). Some studies propose that psychological bonding may shape environmental preferences and thus, could frame and condition restorative experiences (Wilkie & Stavridou, 2013). Similarly, Ruiz and collaborators (2013) postulated that the restorativeness perception of a place may be significantly influenced by the affective bond towards it and they found empirical support to this claim.

The presence of place bonding in restoration studies can be traced back to the seminal studies by Korpela and colleagues, which analyzed the restorative experience of children, adolescents and young adults in their favorite places (Korpela et al., 2002; Korpela, 1992; Korpela et al., 2001; Korpela, 1989). These authors developed the environmental auto-regulation hypothesis, proposing that psychological bonding to places may emerge after a series of restorative experiences when in there.

Recent research has approached the relationship between bonds and restoration in a different way, understanding that the current levels of attachment or identification with a place can boost the restoration experienced when visiting it. In this regard, Ratcliffe and Korpela (2016, 2017) analyzed the role of place attachment and place memories in the experience of restoration. Similarly, other research has shown that a match between a salient personal or social identity and the contemplated environment may elicit greater rates of restoration. In two empirical studies this match led to 1) a strengthening of self-esteem and perceived physical health (Ysseldyk et al., 2016), 2) an increase of intrinsic over extrinsic motivations (Morton et al.,

2017), and 3) an improvement of attentional performance (Morton et al., 2017).

6.1.4 Study aim and hypotheses

The main objective of this experimental study was to explore the role of place attachment and identification in relation to the landscape preferences and the assessment of the restorative properties of landscapes. We proposed and tested two hypotheses.

Building on previous literature on the influence of familiarity in landscape preference and restorativeness (Berto, Barbiero, Barbiero, & Senes, 2018; Hernández, Hidalgo, Berto, & Peron, 2001; Lothian, 2017; Purcell, Peron, & Berto, 2001; Tang, Sullivan, & Chang, 2015) we hypothesized that local landscapes would obtain greater preference ratings and would be evaluated as more restorative than non-local ones (H_1).

Considering the results of past studies on this issue, we hypothesized that preference (Hartig & Staats, 2006a; Staats, Kieviet, & Hartig, 2003; van den Berg et al., 2003), place attachment (Ratcliffe & Korpela, 2016; Ruiz et al., 2013) and place identification (Morton et al., 2017; Ysseldyk et al., 2016) would positively predict inferred restoration scores for local landscapes (H_2).

6.2. Methods

6.2.1 Sample

We recruited 200 university students from the University of the Basque Country UPV/EHU and the University of Chile campuses (100 in each). The sample was composed by 113 women (56.5%) and 87 men with a mean age of 21.94 years ($SD = 3.69$). They were studying different programs (i.e. Psychology, Engineering, Anthropology, Geography, Sciences, Biology etc.).

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6.2.2 *Materials & Instruments*

We took a set of Basque and Chilean natural and urban pictures and established two main landscape categories beforehand: green natural path for the natural domain and urban square or plaza for the urban one. We chose the pictures by taking into consideration natural species and configurations as well as urban designs and architecture usually found, and therefore well known, in Chile and the Basque Country.

With respect to Chile, the natural landscape photograph depicted the Araucanía forest, a national symbol of native southern landscape. The urban landscape picture depicted one of the main urban plazas (Plaza de Armas build in 1541), including Chilean colonial buildings and the neoclassical Santiago Metropolitan Cathedral (built at the end of XVIII century). Regarding the Basque Country, the natural photograph depicted the humid and mild green forests characteristic of the Cantabrian zone. The urban landscape picture depicted a plaza dominated by a neo-gothic church and featuring native vegetation. All the images privileged path and routes, following the idea that a landscape is not merely aesthetical and visual, but rather implies movements and lived-embodied experiences, (Heft, 2010; Menatti & Casado da Rocha, 2016).

After checking the pictures available for both categories, we selected two pictures for each domain. Figures 6.1 and 6.2 depict the selected pictures. We used four pictures, a number relatively smaller than the number used in other studies (Hofmann, Westermann, Kowarik, & Van der Meer, 2012; Schirpke et al., 2013; White & Gatersleben, 2011; Zhao, Wang, Cai, & Luo, 2013). This allowed the collection of a greater amount of information for each picture (more items and variables) in order to explore the

hypotheses of the study. Furthermore, the use of a reduced sample of pictures is not an uncommon practice in the field (Khew, Yokohari, & Tanaka, 2014; Tang et al., 2015). The main reason behind that decision was to use an extensive representation of restoration using an 8-item scale, in opposition to other studies that have operationalized restorative potential with one only statement (Abkar, Kamal, Maulan, Mariapan, & Davoodi, 2011; Nordh, Hartig, Hagerhall, & Fry, 2009; Pazhouhanfar & Kamal, 2014).



Figure 6.1. Pictures of Natural Green Paths (Basque – left side; Chilean – right side) used in the study.

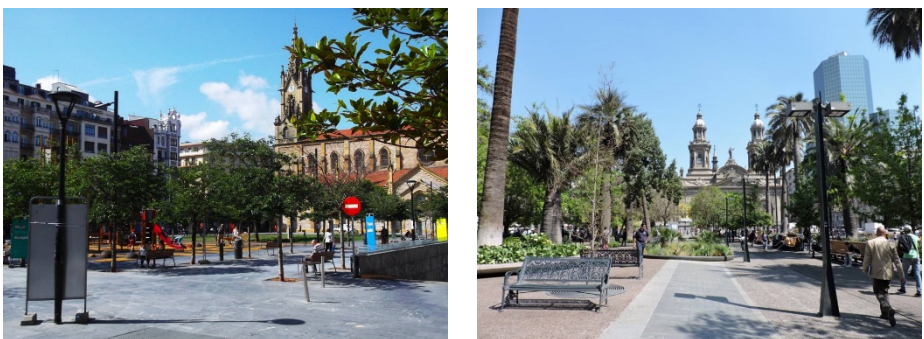


Figure 6.2. Pictures of Urban Squares (Basque – left side; Chilean – right side) used in the study.

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The green path locations were Arantzazu (Basque Country) and the Araucanía Region (Chile) and the urban locations were the Plaza Katalunia (San Sebastián-Basque Country) and the Plaza de Armas (Santiago, Chile). For the natural domain, both green paths go through native forests made up of *Fagus sylvatica* and *Araucaria araucana*, respectively. In the case of the urban settings, both of them showed a similar design. They depicted squares designed for leisure and pedestrian transportation, isolated from traffic, with urban equipment (i.e. benches) and a moderate level of vegetation (grass, trees and flowers). Similarly, both places are limited on one side by a church. Following Zucker's classification of squares (Zucker, 1959), we could define them as good examples of enclosed squares surrounded by the urban matrix and partially dominated by religious buildings.

The questionnaire comprised of four different sections, one devoted to each of the pictures to be shown and rated by the participants. The first part of each section contained 6 items to be answered on a 0 to 5 likert scale (0= *not at all*, 5= *totally*). These items, adapted ad hoc from the Place Attachment and Identification Scale by Ruiz and colleagues (2011), measured preference (1 item, I like this place), place attachment (3 items, e.g. If I do not have the chance to visit this kind of places I miss it) and place identification (2 items, e.g. I identify myself with this place)²⁶. Place attachment items showed fair to good internal consistency along landscape conditions

²⁶ According to the original version of the scale (Ruiz et al., 2011), the items selected and adapted for this study were: 1) item 1 (preference), 2) items 3 and 4 (attachment) and, 3) item 7 (identification). Two additional items were created ad hoc to be added to the attachment and identification measures.

(Cronbach's $\alpha = 0.49-0.76$). A similar performance was observed for the place identification ones (Cronbach's $\alpha = 0.49-0.74$).

The second part of each section began with a short vignette asking to the participants to think of themselves after an intense working day, and then to imagine how they would feel if they visited the place that appeared on the screen. The vignette text is shown in Figure 6.3. After reading the text and imagining themselves in such a psychological state, we invited them to fill in the Spanish adaptation of the Restoration Outcome Scale (Subiza-Pérez et al., 2017, ROS-S, e.g. I would feel calmer after being here) with the same score range used in section 1. The ROS-S, originally developed by Korpela et al. (2008; 2010), measures the main dimensions of the restorative experiences: Relaxation and Calmness, Attention Restoration, Clearing one's Thoughts and Reflection. This scale showed very good internal consistency ratings (Cronbach's $\alpha = 0.93-0.96$).

Now please imagine that you have been working hard in a project that required an intense effort. After working for some hours, you feel tired and notice that it is difficult for you to keep concentrated and make any progress in the task. Besides, you feel a little stressed and realize that the good mood you had before has faded and now you are somewhat nervous and moody.

Imagine that you go for a while to the place that appears in the picture and think how you would feel after contemplating the landscape and walking it using the scale that appears below.

Figure 6.3. Vignette text used in the study as the frame to assess each landscape's restorative potential.

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6.2.3 Procedure

We recruited the participants from the already mentioned university campuses. We invited them to voluntarily participate in a research session. Interested students were led to a lecture hall to receive more information, as well as instructions about how to complete the questionnaire. Due to the fact that no personal data was gathered in the questionnaire, a written informed consent was not required to participants, following the ethics guidelines of the University of the Basque Country UPV/EHU. After filling in a demographic and general information section, picture displaying started. When a picture appeared on the screen we asked participants to fill in the questions regarding it. After all participants finished the task, the next picture was shown. This procedure was repeated until all four pictures were shown. Participants were then thanked and dismissed. We gave the participants the opportunity to ask questions about the study. This procedure took between 10 and 15 minutes depending on the participants speed when filling out the questionnaire. We randomized the order of picture presentation for each of the sessions. There were no repeated picture sequences in the within-campus or the inter-campus level.

6.2.4 Data analysis

We conducted a manipulation check analysis to see whether participants showed greater place attachment and identification levels for their local landscapes than for the non-local landscapes using a repeated measures MANOVA. Secondly, we run another MANOVA to test H_1 (see introduction) for both the natural and urban pictures. We calculated ω^2 for within-subjects comparisons and interpreted them following Kotrlik & Williams's recommendations (2003) as explained in page 89, figure 2.4. Finally, we

constructed Linear Regression Models to explain the restorative potential of the local landscapes through the preference, attachment and identification scores in order to test H₂.

6.3. Results

6.3.1 Manipulation checks

Repeated measures MANOVAs indicated that local natural landscapes elicited greater place attachment [$F(1, 199) = 49.23, p < .001, \omega^2 = 0.07$] and identification [$F(1, 199) = 140.13, p < .001, \omega^2 = 0.20$] than non-local ones²⁷. Similarly, local urban landscapes prompted larger ratings for both variables as well with $F(1, 199) = 19.53, p < .001, \omega^2 = 0.03$ and $F(1, 199) = 114.98, p < .001, \omega^2 = 0.20$ respectively²⁸. Descriptive data for each variable and landscape is presented in Table 6.1.

6.3.2 Comparisons of preference and inferred restoration in local and non-local landscapes

Repeated measures MANOVAs conducted to test H₁ revealed that local natural landscapes ratings for preference and ROS-S significantly differed from the non-local ones, being the former greater than the latter. We observed the opposite effect for urban landscapes, with non-local pictures eliciting greater preference and ROS-S rates. The size of these differences are small but for the case of ROS-S rates for the urban pictures, which is medium. Variable descriptives and MANOVA results can be found in Table 6.2.

²⁷ According to ω^2 , these differences were medium and large in size respectively.

²⁸ According to ω^2 , these differences were small and large in size respectively.

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Table 6.1.

Preference, Attachment, Identification and ROS scales scores per landscape

Natural landscapes	Local	Non-local
Preference (0-5)	4.29 (0.86)	3.92 (1.05)
Attachment (0-5)	3.37 (1.06)	2.73 (1.18)
Identification (0-5)	3.43 (1.07)	2.18 (1.36)
ROS (0-5)	3.78 (0.95)	3.33 (1.24)
Urban landscapes	Local	Non-local
Preference (0-5)	2.41 (1.13)	2.86 (1.22)
Attachment (0-5)	1.96 (0.90)	1.55 (1.20)
Identification (0-5)	2.37 (1.17)	1.17 (1.25)
ROS (0-5)	1.34 (0.98)	2.01 (1.26)

Note: average and standard deviation for preference, attachment, identification and ROS scores for both natural and urban landscapes.

Table 6.2.

Preference and ROS ratings for local and non-local natural and urban landscapes included in the study.

	Local	Non-local	F (1, 199)	<i>p</i>	ω^2
Natural landscapes					
Preference (0-5)***	4.29 (0.86)	3.92 (1.05)	15.76	< .001	.03
ROS (0-5)***	3.78 (0.95)	3.33 (1.24)	27.88	< .001	.04
Urban landscapes					
Preference*** (0-5)	2.40 (1.13)	2.84 (1.21)	26.56	< .001	.03
ROS*** (0-5)	1.34 (0.98)	2.01 (1.26)	53.52	< .001	.08

Note: mean and standard deviation for preference and ROS scores for both natural and urban landscapes, F-statistic, *p* value and ω^2 value. ***=*p* value < .001.

6.3.3 Regression analyses to predict inferred restoration through preference, attachment and identification

As stated in epigraph 2.4, we run regression analyses to predict the inferred restoration for each of the local landscapes. Table 6.3 shows the Pearson correlations between the three predictor variables and the outcome. The model for natural local landscape was statistically significant [$F(3, 196) = 64.60; p < .001$] and predicted a significant amount of the variance in ROS-S (49%). All three predictors were significant. Results of this analysis are shown in Table 6.4. Tolerance and VIF coefficients results were far from the multicollinearity risk level (Sheskin, 2007: p.1464).

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Table 6.3.

Pearson r correlations between predictor variables and ROS for natural and urban local landscapes

Natural local landscape	Preference	Attachment	Identification
ROS	.618**	.644**	.478**
Urban local landscape			
ROS	.544**	.384**	.073

Note: ** = $p < .01$

Table 6.4.

Regression model for natural local landscape

	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
Constant	0.67	0.26	-	2.59	.01
Preference	0.39	0.07	0.36	5.34	<.001
Attachment	0.29	0.07	0.32	4.07	<.001
Identification	0.13	0.06	0.15	2.25	.026

Note: Durbin-Watson = 1.49, $R^2 = 0.49$.

Similarly, the model for the urban local landscape was statistically significant [$F(3, 196) = 34.03; p < .001$] and predicted a significant amount of the variance in ROS (33%). All the three predictors achieved the significant level. Table 6.5 shows the results of this analysis. Tolerance and VIF coefficients did not reach the multicollinearity risk level (Sheskin, 2007: p.1464).

Table 6.5.

Regression model for urban local landscape

	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
<i>Constant</i>	0.19	0.16	-	1.19	.236
<i>Preference</i>	0.41	0.06	0.47	7.13	<.001
<i>Attachment</i>	0.29	0.08	0.26	3.49	.001
<i>Identification</i>	-0.16	0.06	-0.19	-2.82	.005

Note: Durbin-Watson = 2.1, $R^2 = 0.33$.

6.4. Discussion

6.4.1 Study overview and results

This study aimed at assessing the role of place attachment and place identification on landscape preferences and inferred restoration. Results indicated that: 1) local natural landscapes were preferred and assessed as more restorative than foreign ones, 2) local urban landscapes were less preferred and assessed as less restorative than foreign ones, 3) place attachment positively and significantly predicted the assessment of the

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restorative properties of local landscapes (both natural and urban), and, 4) that place identification was a positive and significant predictor of restorativeness for the local natural landscape and a negative one for the local urban landscape.

This inconsistency of the role of place identification is in consonance with classic studies finding that familiarity decreased preference when perceiving landscapes of little aesthetic potential and /or urban landscapes (Canter & Thorne, 1972; Kaplan & Herbert, 1988; Nasar, 1984) but increased in the case of natural environments (for a review, see Lothian, 2017). Moreover, place identification showed a smaller association with inferred restoration than place attachment did. This can be better understood under the light of some recent works that have found that the emotional component of place bonding is more associated with restorative outcomes than the cognitive ones (Knez & Eliasson, 2017; Knez et al., 2018).

6.4.2 Theoretical and methodological implications

The theoretical implications of this study support the importance of personal variables, e.g. such as place attachment and identification, in the prediction of the restorative potential of a landscape. The research conducted showed that when psychologically attached to a landscape, people tend to evaluate its restorative potential to a higher degree than non-personally significant landscapes. That would explain subsequent visits to the landscape place and, if pleasing, they would strengthen such a bonding - in line with previous theoretical explanations (Korpela & Hartig, 1996; Korpela & Ylén, 2007).

Within the field of restoration studies, this study might result in an interesting contribution as it provides evidence beyond the traditional

evolutionary explanations to the perception of landscapes and the restoration processes.

As stated in the introduction, both processes have been usually understood as an evolutionary response to elements critical for survival—such as shelter, water or food- (Appleton, 1975; Falk & Balling, 2010; Kaplan & Kaplan, 1989; Orians & Heerwagen, 1992; Ulrich, 1993). Yet, evolutionary assumptions have been generally criticized due to their limitations regarding the ability of science to adequately disentangle the psyche, the evolutionary pressures and coping strategies that might have characterized the life of human ancestors (Buller, 2009). Specifically in the field of landscape studies, some authors have pointed out the limitations of the evolutionary approach (Joye & de Block, 2011; Joye & Dewitte, 2018; Joye & van den Berg, 2011; Menatti & Casado da Rocha, 2016). In response to this criticism, some works have already considered the role of personal, social and cultural variables as well (Hägerhäll et al., 2018; Knez & Eliasson, 2017; Knez et al., 2018; Morton et al., 2017; Ratcliffe & Korpela, 2016; Qureshi et al., 2013; Wilkie & Stavridou, 2013; Ysseldyk et al., 2016) opening a promising line of inquiry.

In this study we considered the perception and experiences of landscapes as a complex process in which different psychological, cultural and physical elements are intertwined (e.g. see the concept of processual landscape by Menatti and Casado, 2016; see also Dupré, 2010). The perception of landscape is based on a relation and dynamical interaction which goes beyond the mere perception of physical properties.

In the methodological sphere, we opted for an extended operationalization of the restoration construct using an 8-item scale. To be

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suitable, a single-item measure needs to reflect the whole nature of the construct (Fisher, Matthews, & Gibbons, 2016), and the reader must be aware of all of the aspects comprised by the construct (Sarstedt, Diamantopoulos, Salzberger, & Baumgartner, 2016). We consider that single-item scales used in previous studies to measure perceived restoration do not gather all the content of this psychological phenomenon. Therefore, the use of ROS (or ROS-S) is highly recommended, as it properly reflects the main outcomes of the restorative experience, and overcomes the aforementioned limitations.

Following on methodological questions, the collection of repeated measures in a sample composed of participants coming from two different countries is also a virtue of the study presented here.

However, we should acknowledge some limitations. First of all, the pictures might have not shown landscapes that participants frequently use or even know, and therefore their actual bonding to those places might have been more cultural or symbolic than psychological. In this regard, we should specify that attachment and identification measures were only composed by three and two items respectively and that this might have compromised its reliability. It is recommendable for further studies to include wider and more comprehensive measures of these constructs. Secondly, we did not assess direct experiences within the places (e.g. a walk or in situ contemplation), as participants rated pictures shown on a screen. We are aware and agree on the limits of the visual approach to the perception of landscapes and in the evaluation of restorativeness (see for instance Heft & Nasar, 2000). However, there is meta-analytic evidence of the value of both picture-based and in situ methodologies for evaluating landscapes qualities (Stamps, 1990, 2010) and

we suggest that in landscape perception studies both approaches have to be considered. Finally, the reduced set of pictures used in this study makes difficult to generalize its findings. We invite to consider them with caution and highlight the need of further studies to determine if the effects reported here are stable and consistent.

Furthermore, we should consider that landscape preferences are related to cultural elements and, namely, to images. For instance, the history of landscape paintings, history of art and aesthetics has played a major role in influencing landscape preferences (Cosgrove 1997). In conclusion, we recommend future studies to develop these line of inquiry using in situ experiences of landscapes involving all the senses and activities other than watching, but also considering how cultural and media elements influence perception.



CHAPTER 7

THE ROLE OF PLACE ATTACHMENT AND IDENTIFICATION IN THE RESTORATIVE POTENTIAL OF URBAN SQUARES

The content of this chapter is being reviewed for publication in *Cities*:
Subiza-Pérez, M., Vozmediano, L., & San Juan, C. Welcome to your plaza:
assessing the restorative potential of urban squares through survey and
objective evaluation methods.

7.1 Introduction

Cities have been often considered as physically and psychologically demanding, harmful, and stressful environments, due to the exposure to traffic, crowds, and information overload, as well as the reduced presence of natural elements (Corcoran et al., 2017; Fischer, 1984; Marsella, 1998; Milgram, 1970; Nelson et al., 1998). Meanwhile, literature on environmental psychology has usually highlighted the benefits of natural environments in terms of stress alleviation, mood enhancement and cognitive recovery (Kaplan & Kaplan, 1989; Ulrich, 1993). Indeed, one can find multiple papers focused on the health benefits of visiting distant nature places such as national parks, natural reserves or forests (Park et al., 2010; Wolf & Wohlfart, 2014; Wöran & Arnberger, 2012). One of the key psychological processes studied in this context is restoration: the recovery of the cognitive, emotional and social resources diminished by daily performance (Hartig, 2004).

Nevertheless, in the current context of climate change and environmental pollution, the use of distant nature might imply not affordable environmental costs. A number of studies have assessed the ecological impact of leisure trips and raised the awareness about the need of more sustainable ways of understanding and promoting leisure (Dubois & Ceron, 2006; Lin, 2010; McKercher et al., 2010). Similarly, some authors have pointed at the need of studying psychological restoration in urban settings (Karmanov & Hamel, 2008; San Juan et al., 2017; Staats et al., 2016). The provision of more restorative urban settings may entail a double effect: 1) the direct reduction of stress-related conditions due to the general improvement of the urban environment and 2) the reduction of leisure-

related environmental impacts due to the greater accessibility to salutogenic destinations within the city boundaries.

7. 1.1 The role of open urban places -urban squares-

When studying *urban restoration*, previous works chose green settings such as university campuses, forests or parks (Bielinis, Takayama, Boiko, Omelan, & Bielinis, 2017; Plante et al., 2007; Takayama et al., 2014; Tyrväinen et al., 2014), which may be the greenest environments in our cities. Therefore, we decided to focus on a different urban typology: the public square. Squares have been defined as tri-dimensional open spaces limited by the ground, the adjacent buildings and the sky dome (Zucker, 1959) or, simply as open sections of space surrounded by buildings (Moughtin & Mertens, 2003). In the middle of the nature-built continuum (Fischer, 1984), they usually present different levels of greenness and are provided with equipment to support resting, social interactions and/or physical activity (e.g. benches, water fountains or playgrounds). Although varying in size, they tend to have a reduced scale compared to urban parks or forests. They are thought to offer both multisensory contact with nature and some of the benefits of city life (e.g. socialization, dynamism). In words of Catherine Ward Thompson, they might be a public version of the paradise garden (Ward Thompson, 2016; 592).

Public urban squares might play a different role than larger green places, like parks or urban-forests (Peschardt, Schipperijn, & Stigsdotter, 2012; Peschardt & Stigsdotter, 2013). They are greater in number and usually located closer to peoples' houses and workplaces, so they can be visited in the way to somewhere else or function as small outdoor rooms to rest, eat or chat. Following Thwaites and colleagues (2005), it may be of interest to

configure a network of small restorative places along the urban matrix to provide citizens with everyday micro-restorative experiences. These experiences, probably more superficial than the ones achieved in long natural expositions, would help people to keep a better psychological state during their daily life and serve as a buffer for psychologically demanding events.

Recent studies have started to assess the health implications of small open urban places. Despite using different terminologies and approaches, these studies share the idea that open urban places can play a vital role in the maintenance and promotion of health, well-being and social life of city inhabitants. Some highlight the importance of natural elements such as grass, trees or water in the achievement of restoration (Lorenzo et al., 2016; Nordh et al., 2009). Social landscape seems to play also a role, with a study showing that reduced numbers of users prompt more restoration rates than the absence or great presence of them (Nordh, Alalouch, & Hartig, 2011). On the contrary, external features such as noise coming from traffic were found to be negatively related to it (Nordh & Østby, 2013; Peschardt, Stigsdotter, & Schipperrijn, 2014).

One positive advantage of squares over larger and more distant nature destinations is that citizens may visit or pass through them with far greater frequency. Additionally, research on the psychological experience of these urban settings will allow exploring the role of place bonding on the achievement of restorative outcomes. Literature on place bonding usually differentiates between place attachment and place identity (Casakin et al., 2015). The former is defined as a positive affective tie that people establish with places relevant to them (Hidalgo & Hernández, 2001; Lewicka, 2011b).

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Thus, a person attached to a certain place will seek for spending time there, will feel at ease when being there and may experience negative outcomes if visits become impossible or if the place changes. On the other hand, place identity is a section of the self that comprises ideas, preferences and values regarding the place a person is identified with. In this case, a place becomes a part of the personal or group self-concept and it is psychologically experienced as a sense of belonging to that place (Scannell & Gifford, 2010; Uzzell et al., 2002; Valera & Pol, 1994). Recent works in environmental psychology have started to weigh the influence of place bonding variables in the restorative experiences that environments can elicit in their users. For example, the studies by Ratcliffe and Korpela (2016, 2017) showed that place attachment and place memories are significant predictors of restoration achieved through the visits to favorite places. Moreover, contemplating or actually being in a place related to a personal or social identity can strengthen self-esteem, increase intrinsic over extrinsic motivations and ameliorate attentional performance (Morton et al., 2017; Ysseldyk et al., 2016). Therefore, open urban places might be suitable to further develop this line of inquiry as they are frequently used by citizens and a part of the scenario of their daily life.

The general objective of this work was to make a comprehensive approach to the study of restorative experiences in urban squares, also assessing the role of potential predictors related to uses of the square and place bonding. Using a double data-gathering process we obtained information both about the physical/design features of the study settings and the use routines and psychological experience of their users. It was hypothesized that the objective characteristics of the settings, the patterns

of use and the psychological bonding to the place would be related with the experienced restoration when being there.

7.2 Methods

7.2.1 Participants

The sample for this study was composed by 296 people, of which 159 indicated their gender as female (53.9%) and who were 46.87 years old on average ($SD = 16.42$). They were recruited among the users of 6 urban squares in a medium size European city. Genders [$\chi^2(2) = 5.46; p = .362$] and age groups [$\chi^2(15) = 24.69; p < .054$] were similarly distributed across the squares selected for the study.

7.2.2 Instruments

The objective assessment of the study settings was conducted using a section of an instrument used elsewhere²⁹ (San Juan et al., 2017) that allows measuring the presence of natural elements in the site (e.g. trees, grass and masses of water) and the degree of several psycho-environmental features (e.g. coherence, mystery and enclosure).

The questionnaire for users of the squares -designed *ad hoc*- had two sections. The first one, inspired in previous research (Carrus et al., 2015; Laforteza, Carrus, Sanesi, & Davies, 2009), included some general questions about the user profile (age and gender) and how they use the square (distance from residence, week and month use frequency, length of use and performed activities). We registered 8 different activities: walking, meeting friends and relatives, physical activity performance, reading, landscape

²⁹ The full description of this instrument appears in Annexes I and II, please see pages 297 onwards.

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contemplation, drinking/eating something, spending time with dependent persons (e.g. children) and walking the dog. Participants had to indicate whether they usually perform those activities in the square where they were interviewed.

The second section gathered information on several psycho-environmental variables and included the following scales. The short version of *Perceived Restorativeness Scale (PRS)* (Negrín, Hernández-Fernaud, Hess, & Hernández, 2017), a scale composed by 5 items measuring *being away, fascination, coherence, compatibility* and *scope*. The *Spanish version of the Restoration Outcome Scale (ROS-S)* (Subiza-Pérez et al., 2017), an 8-item scale measuring the main aspects of a restorative experience: *relaxation and calmness, attention restoration, clearing one's thoughts* and *reflection*. And finally the *Place Attachment and Place Identity Scale* (Ruiz et al., 2011), in a version by Subiza-Pérez et al. (2017) consisting of 9 items (6 for attachment and 3 for identity). All the scales were presented in a 0-5 Likert scale.

7.2.3 Procedure

One of the authors and three trained research assistants visited the six study sites and assessed them using the objective assessment tool. Pictures of the settings are shown in Figure 7.1.

After this task, the data collection group visited the settings in different times of the day both during the week and the week-end. Different time slots were selected in order to gather the maximum variability regarding users and activities. After arriving to the study sites they individually approached square users and informed them about the nature of the study. Two eligibility criteria were set in advance: 1) participants must be frequent

users of the place (tourists and first/second-timers were not interviewed) and 2) age of at least 18 years old. Informed people, meeting the criteria, that decided to take part were given the questionnaire in a clipboard and fully instructed to complete it. When finished, participants were briefly debriefed and, after answering questions or comments if posed, they were kindly thanked. Following this procedure, data was collected from September to November 2016.

7.2.4 Data analyses

Firstly, ratings of the objective assessment of each study site were compiled calculating an average score. Secondly, we descriptively assessed the profile of users of each square, the activities they performed there and their frequency and moment of use; and a set of chi-squared analyses were done to check if the squares showed different patterns of use. Thirdly, a MANOVA was run in order to compare square ratings for perceived restorativeness, place attachment, place identification and experienced restoration as reported by participants. For these analyses, we calculated between-subjects ω^2 using the formula presented in Figure 2.5 (see page 90) and interpreted them following Kotrlik & Williams's recommendations (2003).

Finally, with the objective of building a predictive model of the restoration achieved in the study settings, a hierarchical linear regression was run. We began running correlation analyses to detect if any of the data gathered in the questionnaire (e.g. objective measures, gender or performed activities) was significantly associated to the restorative outcomes reported by participants. Variables significantly related to the outcome were then introduced in the regression in the corresponding block; 1) objective

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assessment variables, 2) use of the square and activities and 3) psycho-environmental variables.

7.3 Results

7.3.1 Objective assessment of the squares

Results of the objective assessment of the squares are shown in Table 7.1.

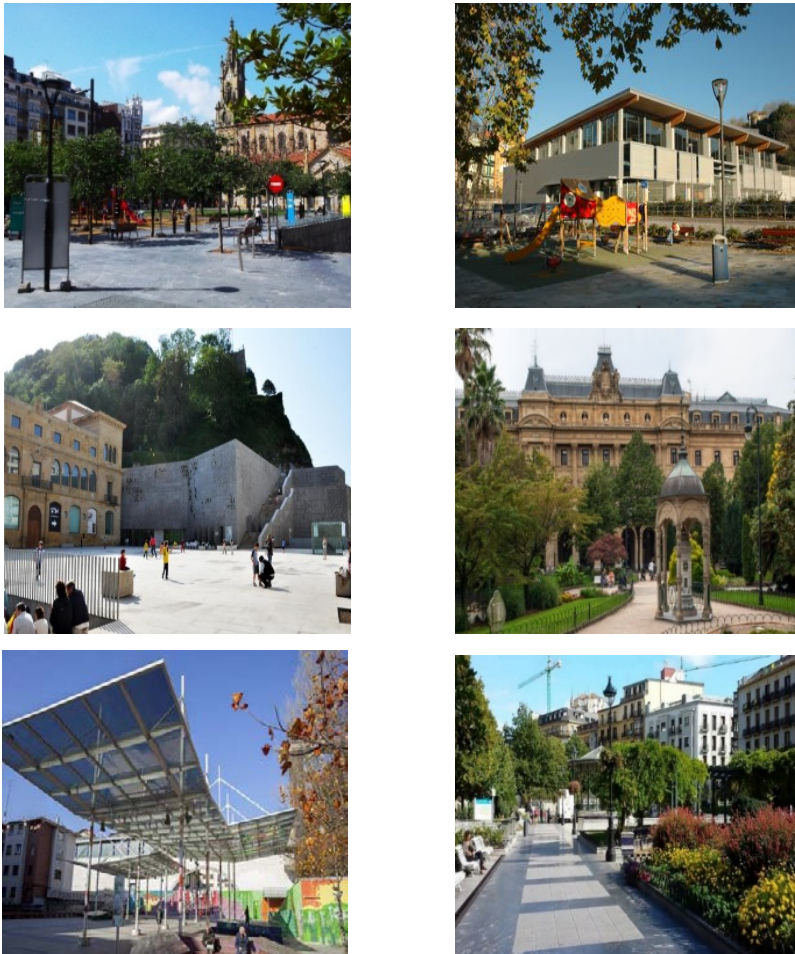


Figure 7.1. Pictures of study settings. First row: Place 1 (left) & Place 2 (right). Second row: Place 3 (left) & Place 4 (right). Third row: Place 5 (left) & Place 6 (right).

Table 7.1.

Results of the objective environmental evaluation of the study settings

	Place 1	Place 2	Place 3
<i>Size (m²)</i>		1,601	3,212
<i>Natural elements: density [0-15]</i>	4 (0.82)	4.75 (0.96)	4.75 (0.50)
<i>Natural elements: diversity [0-15]</i>	4.25 (0.5)	3.25 (0.5)	5.50 (1.29)
<i>Natural elements: aesthetic potential [0-50]</i>	12.75 (2.63)	17 (2.16)	20.25 (3.86)
<i>Psycho-environmental indexes:</i>			
<i>Orientation [0-4]</i>	4 (0)	2.75 (0.5)	3.25 (0.50)
<i>Exploration [0-5]</i>	3.08 (0.96)	1.92 (0.74)	2.58 (0.17)
<i>Coherence [0-5]</i>	4.25 (0.5)	4 (0.27)	3.92 (0.74)
<i>Enclosure [0-5]</i>	4.58 (0.42)	3.83 (1)	3.92 (0.32)
<i>Imageability [0-5]</i>	4.08 (0.69)	3.42 (0.50)	4.17 (0.33)
<i>Prospect [0-5]</i>	4.50 (0.58)	3.50 (0.58)	4 (0.82)
<i>Mystery [0-5]</i>	1 (1.41)	2.50 (0.58)	1.50 (1)
<i>Singularity [0-5]</i>	3.25 (0.96)	2.25 (2.06)	4.25 (0.50)
<i>Identity [0-5]</i>	3.50 (1)	1.25 (0.50)	3.75 (0.50)
<i>Uniqueness [0-5]</i>	3 (0.82)	1 (0.82)	3.50 (1.29)

Note: the table shows the mean score and standard deviation (in brackets) for each environmental variable assessed by the raters. Greater ratings indicate a higher presence of these environmental features in the setting. Numbers inside square brackets define the range of possible scores for each variable.

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	Place 4	Place 5	Place 6
<i>Size (m²)</i>	5,525	1,649	3,265
<i>Natural elements: density [0-15]</i>	9.25 (1.71)	1 (0)	5.75 (0.50)
<i>Natural elements: diversity [0-15]</i>	8.25 (0.96)	1(0)	5 (0.82)
<i>Natural elements: aesthetic potential [0-50]</i>	33.25 (10.08)	5.25 (0.96)	22.50 (4.12)
<i>Psycho-environmental indexes:</i>			
<i>Orientation [0-4]</i>	2 (0.82)	2.75 (0.50)	3.75 (0.50)
<i>Exploration [0-5]</i>	3.17 (0.43)	1.67 (0.67)	2.42 (1.23)
<i>Coherence [0-5]</i>	3.67 (1.19)	3.25 (0.50)	4.17 (0.58)
<i>Enclosure [0-5]</i>	1.58 (0.50)	3.42 (0.17)	3.25 (0.57)
<i>Imageability [0-5]</i>	4.42 (0.69)	3 (0.38)	4 (0.38)
<i>Prospect [0-5]</i>	1.75 (0.96)	3.75 (0.50)	3.75 (0.50)
<i>Mystery [0-5]</i>	4.25 (0.50)	2.25 (1.50)	2.25 (1.50)
<i>Singularity[0-5]</i>	4.75 (0.50)	3 (0.82)	4 (0)
<i>Identity [0-5]</i>	5 (0)	2.75 (0.50)	3.75 (0.50)
<i>Uniqueness [0-5]</i>	5 (0)	1.75 (1.25)	3 (1.41)

Note: the table shows the mean score and standard deviation (in brackets) for each environmental variable assessed by the raters. Greater ratings indicate a higher presence of these environmental features in the setting. Numbers inside square brackets define the range of possible scores for each variable.

7.32 Activities and user profile by square

Square users' residence was located between 0.5 and 300 minutes ($M = 19.14$, $SD = 34.17$) walking from the squares. They visited the specific square where they were interviewed 3.80 ($SD = 7.26$) times a week and 15.06 ($SD = 28.89$) a month on average, and usually spent 53.18 ($SD = 50.12$) minutes each time. Most common activities in the setting were looking after dependent people (49.7%), meeting friends and relatives (49%), walking (43.6%) and eating/drinking something (41.2%). A 27.4% and a 20% of the sample respectively used to contemplate the landscape and read when in the square. Least reported activities were practicing physical activities (9.5%) and walking the dog (5.7%).

Statistical analyses revealed that there were statistically significant differences in the home-square distance [$F(5,290) = 3.31$; $p = .006$] and the average length of use [$F(5,290) = 9.81$; $p < .001$]. Post-hoc comparisons showed that users of place 5 lived significantly closer to it than place 1 and 6 respectively. Similarly, they tended to spend more time there than users of places 1, 4 and 6 respectively. Some other dissimilarities on the stay length were detected too ($P4 < P2$ & $P3$; $P6 < P2$ & $P3$).

When analyzing the dissemination of activities by square we found an unequal distribution for walking [$\chi^2(5) = 27.77$; $p < .001$], practicing physical activities [$\chi^2(5) = 14.56$; $p = .012$], reading [$\chi^2(5) = 22.13$; $p < .001$], landscape contemplation [$\chi^2(5) = 39.83$; $p < .001$], spending time with dependent people [$\chi^2(5) = 63.44$; $p < .001$] and eating/drinking something [$\chi^2(5) = 24.15$; $p < .001$]. In place 1 the frequencies for walking, practicing physical activity and contemplating the landscape were significantly lower than it might be expected whereas the opposite happened with spending

time with dependent people. Place 2 was a better setting for spending time with dependent people and seemingly less suitable for eating/drinking something and contemplating the landscape. Place 3 only had a lower rate of people contemplating the landscape. Place number 4 is apparently a suitable context for walking and contemplating the landscape whereas it is not for practicing physical activity or spending time with dependent people. People using square 5 were more prone to spend time with depending people and less to walk, practice physical activity and contemplate the landscape. In the case of place 6, users were more likely to walk, read and contemplate the landscape. Oppositely, they spent time with dependent people to a lower extent than expected.

7.3.3 Psychological experience of the squares

Table 7.2 depicts the perceived restorativeness, place attachment, place identification and experienced restoration reported by users of each of the squares. Most ratings fall between 2 and 3 in a 0 to 5 scale, meaning that the restorativeness and psychological bonding with the squares were moderate. Statistical significant differences of a small size were detected, with place 5 raising lower levels of perceived restorativeness and attachment than place 4 and granting less restorative outcomes than place 1. Despite the latter, it can be generally stated that all the squares selected for the study had a comparable restorative potential –both perceived and experienced- and that users showed similar levels of attachment and identification with them.

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Table 7.2.

Survey psycho-environmental variables by place, Cronbach's α , MANOVA F statistic, p value and differences between groups

	<i>Perceived restorativeness [0-5]</i>	<i>Place attachment [0-5]</i>	<i>Place identification [0-5]</i>	<i>Experienced restoration [0-5]</i>
Place 1	3.05 (1.10)	2.64 (1.13)	2.85 (1.60)	2.94 (1.35)
Place 2	2.74 (1.20)	2.26 (1.50)	2.05 (1.66)	2.34 (1.45)
Place 3	2.87 (1.03)	2.54 (1.30)	2.49 (1.55)	2.17 (1.33)
Place 4	3.15 (1.03)	2.83 (1.08)	2.56 (1.41)	2.48 (1.15)
Place 5	2.47 (1.22)	2.01 (1.29)	2.18 (1.48)	1.95 (1.35)
Place 6	2.91 (1.14)	2.60 (1.30)	2.44 (1.73)	2.65 (1.30)
Cronbach's α	.82	.92	.93	.94
F (5,290)	2.27	2.57	1.62	3.50
p	.048	.027	.155	.004
ω^2	.02	.03	.01	.04
<i>Pairwise comparisons</i>	P5 < P4	P5 < P4	-	P5 < P1

Note: the table shows the mean score and standard deviation (in brackets) for each psycho-environmental variable reported by participants. Numbers inside square brackets define the range of possible scores for each variable. Only statistically significant differences between sites appear in the table.

7.3.4 Prediction of psychological restoration in the squares

An initial set of correlation analyses (see table 7.3) revealed that size, mystery and some of the activities performed by users were significantly associated to experienced restoration. Moreover, perceived restorativeness, attachment and identification with the square were highly correlated with such an outcome.

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This information was then used to build a hierarchical regression model to predict experienced restoration through the significantly associated variables of the three domains (objective assessment, activities and psycho-environmental variables). As it is shown in table 7.4, 7.5 and 7.6, variables coming from the objective assessment and the activities performed at the square did an almost irrelevant contribution to the predictive model whereas perceived restorativeness and place attachment were associated to the outcome to a greater extent.

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Table 7.3.

Correlation between experienced restoration and other study variables

	Experienced restoration
Objective assessment	
<i>Size</i>	.141*
<i>Natural elements: density</i>	-
<i>Natural elements: diversity</i>	-
<i>Natural elements: aesthetic potential</i>	-
<i>Orientation</i>	-
<i>Exploration</i>	-
<i>Coherence</i>	-
<i>Enclosure (inverse)</i>	-
<i>Imageability</i>	-
<i>Prospect</i>	-
<i>Mystery</i>	-.120*
<i>Singularity</i>	-
<i>Identity</i>	-
<i>Uniqueness</i>	-
Use of the square and activities	
<i>Frequency of use (week)</i>	-
<i>Frequency of use (month)</i>	.149*
<i>Time of use (minutes/time)</i>	-
<i>Walking</i>	.166*
<i>Meeting friends and relatives</i>	-
<i>Practicing physical activity</i>	-
<i>Reading</i>	.145*
<i>Landscape contemplation</i>	.325**
<i>Walking the dog</i>	.136*
<i>Spending time with depending people</i>	-.184*
<i>Eating/drinking something</i>	-
Psycho-environmental variables	
<i>Perceived restorativeness</i>	.808**
<i>Place attachment</i>	.760**
<i>Place identification</i>	.564**

Note: * = p value < .05; ** = p value < .01. Non-statistically significant coefficients are not reported.

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Table 7.4.

Hierarchical regression model to predict experienced restoration through study variables (step 1)

		Step 1			
Model variables	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
<i>Size</i>	7.93 ⁻⁵	< 0.001	0.13	2.21	.028
<i>Mystery</i>	-0.14	0.08	-0.10	-1.80	.073
Model statistics					
F			4.60		
Degrees of freedom			2 , 293		
<i>p</i>			.011		
Adjusted R ²			.02		

Note: Durbin-Watson = 1.95, β = standardized regression coefficient.

Table 7.5.

Hierarchical regression model to predict experienced restoration through study variables (step 2)

	Step 2				
Model variables	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
<i>Size</i>	8.64 ⁻⁵	< 0.001	0.14	2.53	.012
<i>Mystery</i>	0.02	0.08	0.01	0.25	.801
<i>Frequency of use (month)</i>	.01	.01	.06	1.06	.292
<i>Walking</i>	0.24	0.15	0.09	1.54	.125
<i>Reading</i>	0.33	0.19	0.10	1.75	.081
<i>Landscape contemplation</i>	0.73	0.18	0.24	4.17	< .001
<i>Walking the dog</i>	0.71	0.31	0.12	2.26	.024
<i>Spending time with dependent people</i>	-0.36	0.16	-0.13	-2.27	.024
Model statistics					
<i>F</i>	7.40				
Degrees of freedom	8 , 287				
<i>p</i>	< .001				
Adjusted R ²	.15				
Δ Adjusted R ²	.14				

Note: Durbin-Watson = 1.95, β = standardized regression coefficient.

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Table 7.6.

Hierarchical regression model to predict experienced restoration through study variables (step 3)

Model variables	Step 3				
	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
<i>Size</i>	8.44 ⁻⁵	< 0.001	0.14	4.01	<.001
<i>Mystery</i>	-0.01	0.05	-0.01	-0.24	.808
<i>Frequency of use (month)</i>	0.001	0.002	0.01	0.43	.670
<i>Walking</i>	-0.01	0.10	-0.01	-0.07	.941
<i>Reading</i>	0.24	0.12	0.07	2.07	.040
<i>Landscape contemplation</i>	0.20	0.11	0.07	1.81	.072
<i>Walking the dog</i>	0.19	0.19	0.03	0.97	.332
<i>Spending time with dependent people</i>	-0.08	0.01	-0.03	-0.79	.430
<i>Perceived restorativeness</i>	0.64	0.06	0.53	10.13	< .001
<i>Place attachment</i>	0.29	0.06	0.28	4.52	< .001
<i>Place identification</i>	0.02	0.04	0.02	0.49	.625
Model statistics					
F	58.16				
Degrees of freedom	11 , 284				
<i>p</i>	< .001				
Adjusted R ²	.68				
Δ Adjusted R ²	.52				

Note: Durbin-Watson = 1.95, β = standardized regression coefficient.

7.4 Discussion

In this study, we assessed the psycho-environmental attributes of a set of 6 public squares in a medium-size European city. Additionally, a questionnaire allowed us to gather information about how people use these settings, their bonding to them and the psychological benefits they usually obtain when in the squares. Despite some differences in design features and size, particularly for places 4 and 5, the settings selected for the study were quite comparable examples of Mediterranean/south European squares. This might invite to consider what these squares have in common instead on focusing on the objective differences among them. First, all the squares were correctly integrated in the urban matrix and were adequately equipped for citizens' use (e.g. benches, water fountains, playgrounds, trees...). Squares are thought to be environments offering opportunities to rest, socialize and be physically active, activities that might be undermined in the rest of the urban landscape (Nordh & Østby, 2013; Thwaites et al., 2011; Ward Thompson, 2016). In the end, they are exceptional settings inside the compact city that highly contrast with streets and roads with higher presence of cars, noises and transportation uses. Similarly, it was also curious to find that objectively assessed dissimilarities did not seem to have a strong influence on users' bonding with the squares.

We found that the most and least green squares elicited the greatest and lowest restoration rates in their users. Paradoxically, results also indicated that the least restorative square –being also the one with lowest attachment rates- was however the most used one in terms of use length. In general, the squares selected for the study seemed to offer a moderate restorative experience, with ratings between 2 and 3 in a 0-5 scale (*ROS-S*).

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It has been stated elsewhere that open urban places might provide with lower-end or moderate restorative experiences (Nordh et al., 2009; Subiza-Pérez, Korpela, & Pasanen, *under review*; Thwaites et al., 2005). It may be that even the more positive urban environments could not offer psychological benefits to the same extent as distant nature places do (San Juan et al., 2017; p.3). Nevertheless, medium-level restorative experiences could be enough if our aim is to understand and promote healthy urban environments since urban population is growing and sustainable life and leisure styles need to be promoted (Dubois & Ceron, 2006; Kabisch, van den Bosch, & Laforteza, 2017; McKercher et al., 2010; United Nations, 2014).

The fact that different squares led to the practice of a different set of activities may inform about the effects of square design in terms of use patterns. This finding is consistent with a recent study also showing that activity patterns vary through urban squares and times of the day (Valera, Pérez-Tejera, Anguera, & Sicilia, 2018). James Gibson (1979) proposed that environments will offer different behavior or performance options to their users. Due to the relative homogeneity of the squares used in this study, this possibility must be tested by the means of measuring more design variables and counting on a greater squares sample.

Using ART and SRT as main source of inspiration for studies on psychological restoration might bring the limitation of overlooking other variables – maybe specific of built environments – closely linked to the experience of psychological benefits. An example of this might be the inclusion of pieces of art.

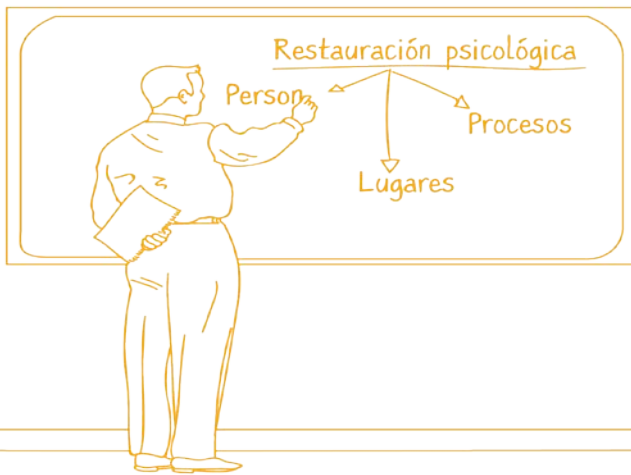
Finally, our study allowed testing the predictive value of objective features, use patterns, activities and psychological variables in the restoration experienced by the use of public squares. Here, evidence pointed at the small or null predictive power of physical variables such as size, greenness or mystery (between others) and the performed activities. However, the perceived restorative qualities of a place and the psychological attachment towards it resulted to be very relevant predictors. The case of cognitive elements of place bonding being less associated than the emotional ones to such an outcome has been also reported in recent studies (Knez & Eliasson, 2017; Knez et al., 2018). Altogether, this might be a point supporting the subjectivist perspective of landscape studies suggesting that beauty is in the eye of the beholder (Heras-Escribano & de Pinedo-García, 2018; 2) and that perceptions of restoration are closely linked to the actual restorative experience (Ruiz et al., 2013). The question of which other psychological and social variables might be associated to this outcome remains open for further investigation.

7.5 Conclusion

XXI century cities have to evolve in order to meet the manifold challenges we are facing today. Urban planners and designers must devote their efforts to provide answers to the rise of climate change outcomes and non-communicable diseases - among other phenomena- in order to reduce the environmental impact of city life and promote citizens' health. In addition, open urban places might serve also to address the social needs of societies more and more complex, multicultural and diverse. In this context, the regeneration and potentiation of public space is key. The constitution of a network of places fostering physical activity, social interaction and improving

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psychological health along the urban grid might constitute a remarkable initiative in such a context.



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CONCLUSIONES FINALES

8.1 Conclusiones bloque 1

8.1.1 Análisis de los estudios realizados a la luz de la revisión sistemática

En la revisión presentada en el primer capítulo de este trabajo se recopilaban y analizaban 19 estudios de campo experimentales o cuasi experimentales de restauración con medidas pretest y posttest. A la luz de dicha revisión se constató que la gran mayoría de trabajos utilizaban muestras universitarias, a las que exponían a un tratamiento ambiental de duración variada que consistía normalmente en el paseo y/o la contemplación de espacios verdes o naturales. Cuando se utilizaban entornos urbanos no verdes, solía tratarse de calles comerciales. Para medir la restauración obtenida, los/as autores/as utilizaban medidas cognitivas, afectivas y/o fisiológicas.

A pesar de que, tal y como se concluye en dicha sección, los resultados de los estudios apoyaban las principales premisas de las teorías de la restauración, la utilización de dos herramientas de análisis de la calidad de los artículos reveló algunos déficits importantes. En primer lugar, la voluntariedad de las muestras y su naturaleza predominantemente universitaria comprometía la representatividad y dificultaba la extrapolación de sus resultados a otros grupos poblacionales. En segundo, la ausencia de grupos control impedía controlar el efecto del mero paso del tiempo y del aprendizaje en la respuesta a los instrumentos utilizados.

Asimismo, en el apartado de presentación de los resultados se echó en falta el reporte y la reflexión acerca del nivel de fatiga o necesidad de restauración de los/as participantes previo a la situación experimental. Uno de los objetivos principales que tenía el trabajo de revisión era el de integrar los efectos encontrados en los estudios para así poder disponer de

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información suficiente para medir adecuadamente la dimensión de los procesos de restauración psicológica. La patente ausencia de datos tan básicos como las medias y las desviaciones típicas de las variables objeto de estudio dificultó sobremanera la realización de dicha tarea y, la bajísima tasa de respuesta de los/as autores/as al ser contactados/as, la impidió definitivamente. Por tanto, en la revisión también se recomendaba la inclusión en todos los trabajos futuros de dichos datos para así poder meta-analizarlos.

La revisión concluía con la enumeración de una serie de retos o líneas de futuro que habrían de ser tenidos en consideración en las subsiguientes investigaciones en este campo de estudio. Dicha enumeración, y el análisis de la literatura del que surge, sirvió de punto de partida para la realización de algunos de los estudios presentados en esta tesis (capítulos 2, 3 y 4). En líneas generales, se puede afirmar que el grado de respuesta a los retos planteados ha sido variable y en ningún caso exhaustivo. A continuación, se expondrán cada una de esas líneas de desarrollo acompañadas de una reflexión sobre su grado de consecución en los citados estudios.

- **Línea 1.** *Incluir muestras no universitarias.* A pesar de que el estudio presentado en el capítulo 2 se realizó con estudiantes universitarios/as, los capítulos 3 y 4 recogen estudios realizados con adultos de mediana edad y personas mayores respectivamente.
- **Línea 2.** *Comprobar que los/as participantes están fatigados/as y/o estresados/as antes de la situación experimental.* Además de medir y reflexionar sobre el estado psicológico previo al comienzo de la actividad evaluada, se recogió el número de horas de esfuerzo

psicológico durante el día y la semana previa a la situación experimental (capítulos 2 y 3). Ha de decirse en este punto que, a pesar de que la cantidad de horas de esfuerzo era significativa en el estudio de plazas y el primero de los paseos de Nordic Walking, las puntuaciones pretest no informaban de una gran necesidad de restauración psicológica. Este hecho condiciona la interpretación de los resultados, que, a pesar de indicar un patrón general de influencia positiva en el estado psicológico, probablemente sea menor que lo que se obtendría con muestras con mayor necesidad de restauración.

- **Línea 3.** *Usar grupos control para evaluar el potencial restaurador de las actividades y los entornos separadamente.* En este caso ninguno de los estudios presentados ha utilizado grupos de control. En el primero de ellos no se conformó un grupo de control porque esto hubiese significado una importante reducción en el tamaño de los grupos experimentales. En los otros dos casos se evaluaron actividades organizadas por organismos externos y no se planteó esta posibilidad ya que no se quiso generar molestia alguna a las personas participantes, que ya se iban a prestar a rellenar los cuestionarios antes y después de las actividades.
- **Línea 4.** *Utilizar instrumentos para medir cognición/atención, estado afectivo y fisiológico y acordar un kit de medidas estándar.* En el primero de los estudios se recogieron medidas atencionales y afectivas. En los estudios presentados en los capítulos 3 y 4 no se recogieron medidas cognitivas por motivos de orden práctico. Los

participantes iban llegando en diferentes momentos antes del comienzo de la actividad y haberlos organizado a todos para cumplimentar la medida atencional al mismo tiempo habría supuesto un retraso importante en el comienzo de la actividad. En ninguno de los estudios presentados se utilizaron instrumentos para medir variables fisiológicas ya que no entraban dentro del campo de especialización del equipo de investigación. Sin embargo, ha de apuntarse que se han escogido los instrumentos atencionales y afectivos que se han considerado más adecuados de entre los utilizados por los estudios previos, permitiendo por tanto comparar en un futuro los resultados obtenidos con los de otros trabajos. Además, la medición de las variables afectivas ha sido considerablemente constante.

- **Línea 5.** *Expandir el set de medidas tradicional para incluir otros recursos, habilidades o medidas innovadoras.* Ninguno de los estudios realizados ha incorporado medidas en la línea de lo planteado, quedando dicha cuestión abierta para futuros estudios.
- **Línea 6.** *Estudiar el potencial restaurador de actividades e intervenciones ambientales diferentes.* El estudio presentado en el capítulo 2 analiza el potencial restaurador de las actividades más estudiadas en la literatura; pasear y contemplar el lugar, por lo que no ha servido para avanzar en la línea de lo propuesto. En cambio, los capítulos 3 y 4 lo han hecho, al analizar actividades que no habían aparecido hasta la fecha en la literatura propia de la restauración psicológica.

- **Línea 7.** *Comparar el efecto de diferentes dosis (duración) de las intervenciones ambientales.* A pesar de que las intervenciones ambientales de los diferentes estudios aquí presentados variaban en duración (desde la media hora hasta la hora y media), la diferente naturaleza de las actividades no permite hacer tal comparativa. Por ejemplo, en el caso del Nordic Walking, el segundo de los paseos fue un 50% más largo que el primero, pero al realizarse en un entorno distinto no permite aislar el efecto de la duración.
- **Línea 8.** *Ofrecer una descripción y análisis más detallados de los escenarios experimentales atendiendo a sus características físicas y sociales.* Dentro del marco de esta tesis se ha desarrollado de una herramienta de observación para ser utilizada en espacios urbanos abiertos (véanse Anexo I y II). Esta herramienta, que recoge información acerca de variables físicas y de diseño, así como sobre las características sociales del espacio (usos, actividades, perfil de los/as usuarios/as) ha servido para hacer un análisis más profundo de los escenarios del estudio presentado en el capítulo 2. Igualmente, aunque fuera de este bloque, se utilizó en el estudio del capítulo 7. La utilización de éste u otros instrumentos de forma sistemática en futuros estudios propios y ajenos podría servir para profundizar en los correlatos físico-sociales de la experiencia de restauración urbana.
- **Línea 9.** *Diseñar estudios que permitan comparar el nivel de potencial restaurador de diferentes espacios naturales/verdes y urbanos.* El capítulo 2 ha servido para comparar el potencial restaurador de dos

plazas urbanas. Sin embargo, ninguno de los trabajos presentados en los capítulos 3 y 4 ha permitido dar pasos en esta línea. La replicación de cualquiera de ellos manteniendo constante la intervención ambiental y variando el escenario en el que se desarrolla permitiría dar respuesta a esta línea de futuro.

- **Línea 10.** *Informar de forma más pormenorizada de los resultados obtenidos, indicando las puntuaciones pretest y posttest y sus desviaciones típicas para permitir su futura integración estadística.* Los tres estudios de campo incluidos en el primer bloque de la tesis han sido presentados reportando dichos datos e índices de tamaño del efecto, permitiendo de tal forma que futuros trabajos puedan integrarlos con los de otras investigaciones a través de procedimientos meta-analíticos.

8.1.2 Síntesis de los resultados de los estudios de campo

Antes de proceder a la integración, conceptual y discursiva, de los resultados obtenidos en los tres estudios de campo incluidos en el bloque 1 de este trabajo, ha de realizarse un comentario general que permita encuadrarlos adecuadamente. En primer lugar, ha de tenerse en cuenta que cada uno de los estudios tiene una naturaleza distinta. En términos de muestra, si bien no hay grandes diferencias en el número total de participantes, sí las hay en su composición demográfica, especialmente en la edad. En segundo, las intervenciones ambientales han sido bastante variadas, desde el paseo y la contemplación individual en plazas urbanas hasta la práctica de actividades grupales como el Nordic Walking o el Taichi-Yoga. En tercer lugar, los escenarios en los que se han llevado a cabo tampoco han sido constantes.

Los estudios presentados en los capítulos 2 y 4 comparten el hecho de haber sido desarrollados en espacios específicos de la ciudad de Donostia como pueden ser algunas de sus plazas y playas. Sin embargo, en el caso de las marchas de Nordic Walking, los escenarios eran mucho más amplios al tratarse de recorridos a lo largo de la ciudad.

A este marco general han de incluirse las limitaciones correspondientes al diseño inter-sujetos que se ha utilizado y al reducido tamaño de las muestras. Se optó por un diseño intersujetos dada la dificultad general de encontrar muestras dispuestas a inversiones importantes de tiempo en la participación en estudios científicos en ausencia de contraprestaciones o compensaciones económicas. En el caso del alumnado universitario, plantear un diseño intrasujetos habría reducido probablemente el tamaño final de la muestra. En el caso de las personas participantes en los otros dos estudios, se evitó plantearlo por temor a saturarlas y afectar negativamente al funcionamiento normal de las actividades organizadas por los organismos colaboradores. El tamaño de las muestras viene dado nuevamente, en el primero de los estudios, por la dificultad para reclutar muestra universitaria sin la posibilidad de ofrecer compensaciones de tipo económico o de otro tipo a cambio de su participación. En el caso de los otros dos estudios, al evaluarse actividades organizadas por organismos ajenos (Programa PLUS 55 y Euskadiko Nordic Walking Elkartea), se partió del número de personas interesadas en participar de entre las que acudieron a las actividades, no pudiéndose hacer reclutamientos adicionales de participantes.

La tabla 8.1. muestra los tamaños del efecto de las diferencias pretest-posttest para las variables estudiadas. Como se puede comprobar en

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la misma, la primera de las intervenciones – paseo y contemplación en dos plazas– produjo cambios significativos en la mayoría de las variables incluidas en el estudio llevando a las personas participantes a un mejor estado atencional y afectivo. Los tamaños de estos efectos fueron pequeños para la fatiga y el vigor, moderados para la capacidad atencional, la cólera-hostilidad, la perturbación afectiva total y la felicidad percibida y grandes para la tensión-ansiedad y el stress. Este resultado es importante en la medida en la que dicha intervención ambiental, diseñada siguiendo la práctica habitual de los estudios de campo en entornos verdes o naturales, ha encontrado un patrón de restauración similar a los de dichos estudios.

En el caso de las marchas de Nordic Walking observamos como propiciaron una reducción en la mayoría de indicadores de afecto negativo así como un incremento del vigor y la felicidad percibida. En esta ocasión los tamaños del efecto fueron de tamaño pequeño y medio salvo para el estrés y la felicidad en la primera de las marchas, que fueron grandes.

En el caso de las actividades grupales al aire libre, vemos nuevamente que los tamaños del efecto son pequeños (tensión-ansiedad, depresión-tristeza y afecto positivo) y medianos para el resto de variables, observándose un patrón general de influencia positiva en las variables de estudio.

Tabla 8.1

Tamaño del efecto de las diferencias pretest-posttest para cada uno de los estudios realizados en el bloque 1

Intervención ambiental	CA	T-A	D-T	C-H	F	V	TMD	AP	ES	FE
Paseo y contemplación en plaza urbana – 30’-	.06***	.18***	< .01	.07***	.04**	.01*	.05*		.18***	.06***
Marcha NW centro de ciudad - 60’-		.13***	.08**	.02*	< .01	.06*	.07**	.01	.23***	.17***
Marcha NW playas- 90’-		.09**	.10**	.01	.01	.01***	.07**	.03**	.07*	.03**
Actividad grupal al aire libre - 60’-		.04*	.02*	.07***	< .01	.06***	.09***	.02**	.06**	.06**

Nota: CA = Capacidad atencional, T-A = Tensión-ansiedad, D-T = Depresión-tristeza, C-H = Cólera-hostilidad, F = Fatiga, V = Vigor, TMD = Perturbación emocional total (en sus siglas en inglés), AP = Afecto positivo, ES = estrés y FE = Felicidad. Los valores en las casillas corresponden al tamaño del efecto ω^2 . Los asteriscos indican el nivel de significatividad del efecto encontrado; * = $p < .05$, ** $p < .01$ y *** $p < .001$. Las casillas sombreadas en gris indican que dicha variable no se midió en ese estudio.

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Tal y como se presentaba en la introducción de esta tesis doctoral, el meta-análisis de McMahan y Estes (2015) reportaba efectos medios para los afectos positivos y pequeños para los negativos. Los tamaños del efecto aquí encontrados son iguales o mayores en la gran mayoría de casos. Esto no significa *per se* que las intervenciones ambientales aquí utilizadas sean más restauradoras que las de los otros estudios y probablemente se explique por la sensibilidad de las muestras pequeñas ante la varianza de los datos (Schweizer y Furley, 2016).

A pesar de lo anterior, tomados globalmente estos resultados permiten:

- a) Avalar provisionalmente, a falta de trabajos de replicación, el potencial restaurador de las plazas urbanas y dar respuesta al primero de los objetivos de esta tesis doctoral.
- b) Presentar evidencia acerca del potencial restaurador de la marcha nórdica y cubrir un gap de la literatura acerca de esta actividad. En la línea de lo esperado, la práctica grupal del NW propició niveles remarcables de restauración afectiva.
- c) Aportar evidencia acerca del potencial restaurador de actividades grupales al aire libre, permitiendo extender el *scope* tradicional de los estudios pretest-posttest de campo en restauración.

Asimismo, los resultados de este bloque permiten valorar experimentalmente los beneficios restauradores de distintos escenarios de la ciudad de Donostia-San Sebastián y podrían entenderse como un análisis de las opciones para la restauración a disposición de la ciudadanía donostiarra.

8.2 Conclusiones bloque 2

Los estudios presentados en el segundo de los bloques de este trabajo tenían como objetivos generales continuar explorando el potencial restaurador de los espacios urbanos y evaluar el papel que la vinculación psicológica con los mismos podría jugar en la obtención de beneficios restauradores a través del contacto con ellos. Para ello se han desarrollado dos estudios de encuesta (capítulos 5 y 7) y uno experimental de laboratorio (capítulo 6). A continuación, se sintetizan los resultados obtenidos en los siguientes epígrafes

8.2.1 Acerca del potencial restaurador de los espacios urbanos

Una de las fortalezas del trabajo presentado en este bloque ha sido la consistencia metodológica en la utilización de los instrumentos de medida. La medida principal de restauración psicológica utilizada en los tres estudios presentados en esta sección (capítulos 5, 6 y 7) es la adaptación española de la *Restoration Outcome Scale*. Además, esta escala ha sido presentada siempre en un intervalo del 0 al 5. Debido a esto, se puede establecer cierta comparativa en los resultados obtenidos en los tres estudios para así valorar el potencial restaurador de los espacios urbanos incluidos en los mismos.

Los resultados del estudio presentado en el capítulo 5 indicaban como los lugares preferidos por las personas participantes obtenían

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puntuaciones medio-altas ($M = 3,09$) en la escala de restauración, mientras que los otros dos lugares obtuvieron puntuaciones más bajas ($M = 1,71$ y $0,53$ respectivamente). En el resto de capítulos del bloque se presta especial atención a una determinada tipología urbana, la plaza. Las dos plazas que aparecían en el set de imágenes utilizadas en el estudio presentado en el capítulo 6 obtuvieron puntuaciones bajas en la escala ROS³⁰ ($M = 1,78$ y $M = 1,09$). A pesar de que a esta evaluación se le puede achacar la limitación de haber sido realizada a través de la observación de una sola fotografía, es evidente que estos escenarios recibieron un puntaje mucho menor que los naturales ($M = 3,66$ y $M = 3,44$). El capítulo 7, que describe la experiencia restauradora de una muestra de 296 sujetos en diferentes plazas de la ciudad de Donostia, resulta también esclarecedor en esta línea. Si bien es cierto que las puntuaciones de restauración percibida eran medio-altas (de $M = 2,47$ a $M = 3,15$) las tasas de restauración obtenida eran algo menores (de $M = 1,95$ a $M = 2,94$), aunque siempre en la parte media del intervalo. Esta constatación informaría acerca del potencial restaurador de esta tipología urbana.

Gracias a que la escala ROS ha sido utilizada también en otros estudios, se puede realizar una comparativa entre las puntuaciones obtenidas en los estudios realizados dentro de esta tesis y esos otros trabajos. Como se observa en la tabla 8.2, algunos estudios en los que la muestra de lugares evaluados estaba compuesta mayoritariamente por escenarios naturales o con gran presencia de elementos naturales, las

³⁰Estas puntuaciones son distintas a las reportadas en el capítulo 6 ya que aquí se han calculado las medias para cada foto en lugar de la puntuación de las fotos locales y no locales.

puntuaciones se agrupan en el extremo superior de la escala (Korpela et al., 2010; Ratcliffe y Korpela, 2016). Sin embargo, en aquellas ocasiones en las que se han utilizado escenarios urbanos construidos las puntuaciones caen en las secciones intermedias y bajas de la escala. Este fenómeno también se observa en las puntuaciones de los escenarios naturales y urbanos incluidos en el estudio presentado en el capítulo 6 de esta tesis.

Tal y como se ha apuntado previamente en este trabajo, esta realidad puede deberse a varios factores. En primer lugar, podría descansar en el hecho de que muchos de los espacios de las ciudades, incluidos aquellos especialmente diseñados para el recreo y el esparcimiento, quizá no presenten todos los elementos necesarios para brindar a sus usuarios/as experiencias restauradoras de mayor envergadura. Paralelamente es posible que, aun presentando un diseño adecuado, otros factores de la dinámica urbana como el tráfico, los ruidos, la presencia de otros grupos o usuarios/as, entre otros, pueda estar afectando a la obtención de unos beneficios psicológicos que si pudieran obtenerse en los mismos espacios pero en otras circunstancias. Por último, y siguiendo a Thwaites et al., (2011), es posible que la experiencia de restauración en contextos urbanos no responda a los mismos patrones y cánones que la restauración en naturaleza y que por

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Tabla 8.2.

Comparación de puntuaciones ROS por estudio

Estudio	Muestra	Lugar evaluado	Puntuaciones ROS en base 1 ³¹
(Korpela y Ylén, 2009)	N= 116 adultos (condición lugar favorito)	Lugar favorito cercano al domicilio (no especificado)	0,53-0,57
(Korpela et al., 2010)	N = 1273 adultos	Lugar favorito; espacios urbanos verdes, espacios urbanos, riberas/orillas, zonas práctica hobbies y deportes y áreas naturales extensas.	0,83
(Takayama et al., 2014)	N = 45 estudiantes	Entornos forestales y urbanos	Bosque = 0,71 Ciudad = 0,55
(Tyrväinen et al., 2014)	N = 77 adultos	Bosque, parque y centro de ciudad	Bosque = 0,73 Parque = 0,72 Ciudad = 0,60
(Ratcliffe y Korpela, 2016)	N= 234 adultos	Lugar favorito (no especificado)	0,74
(Gidlow et al., 2016)	N = 38 adultos	Sendas a lo largo de diferentes paisajes	Canal = 0,49 Verde = 0,49 Residencial = 0,31

³¹Se presentan en base 1 dado que la escala Likert en la que ha sido utilizado el instrumento varía en algunos de los estudios aquí recogidos.

Estudio	Muestra	Lugar evaluado	Puntuaciones ROS en base 1
(Subiza-Pérez et al., <i>en revisión</i>)	N = 34 estudiantes universitarios	Dos plazas urbanas	0,45 y 0,46
Capítulo 5	N = 170 adultos	Lugar urbano favorito: parques, paseos, plazas, miradores...	Lugar 1 = 0,62 Lugar 2 = 0,34 Lugar 3 = 0,11
Capítulo 6	N = 200 estudiantes universitarios	Dos caminos verdes y dos plazas urbanas	Natural = 0,69 - 0,73 Urbano = 0,22 - 0,36
Capítulo 7	N = 296 adultos	Plazas urbanas	0,49 – 0,63

tanto, utilizar las medidas de restauración “natural” para estudiar la “urbana” esté conduciendo a un entendimiento limitado de la segunda.

En este sentido parece que la experiencia de restauración suele representarse como la utilización sosegada de espacios naturales tranquilos, con buen tiempo y nula o reducida presencias de otros seres humanos. La experiencia de restauración en entornos urbanos, si hubiéramos de hablar en esos términos, comprende inevitablemente un mayor dinamismo y una mayor presencia de personas y actividades. Por tanto, no sería descabellado pensar que sus beneficios, además de ciertas tasas de recuperación afectiva y cognitiva, pudieran ser otros. Ejemplo de ello sería la propuesta de Thwaites y colegas (2011) cuando dicen que la experiencia de restauración urbana estaría acompañada de incrementos en la auto-estima. Una exploración más profunda de la experiencia de restauración urbana, con

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aproximaciones cualitativas o incluso fenomenológicas podría servir para dar un paso importante en esta línea.

8.2.2 Sobre el papel de la vinculación psicológica

En el caso de las variables de vinculación psicológica se ha utilizado también una sola medida, la *Escala de Apego e Identificación*, si bien en el caso del estudio de laboratorio (capítulo 6) solo se utilizaron algunos de sus ítems. En el estudio presentado en el capítulo 5, las puntuaciones medias de apego e identificación con el “lugar gustado” fueron de 3,34 y 2,31 respectivamente en una escala del 0 al 5, mientras que las del resto de lugares obtuvieron puntuaciones más bajas 1,52 y 1.26 respectivamente para el lugar dos y 0,47 y 0,45 para el tres. Por su parte, la investigación presentada en el capítulo 6 indicaba que las personas participantes reportaron niveles intermedios de vinculación psicológica con los paisajes naturales mostrados (apego: 3,37 y 2,73, identificación: 2,18 y 3,43). Para los paisajes urbanos, ambos índices resultaron menores (apego: 1,96 y 2,37, identificación: 1,55 y 1,17). En el caso de las plazas estudiadas en el capítulo 7, las puntuaciones medias de apego oscilaron entre el 2,01 y el 2,83 y las de identificación en un rango similar (2,05 – 2,85). Estas puntuaciones son compatibles con la hipótesis de distribución curvilínea del apego a través de las diferentes escalas de lugares (Lewicka, 2010), que establece que los espacios en posiciones intermedias del continuo casa-país/continente/planeta despiertan niveles igualmente intermedios de dicha variable. En la actualidad disponemos de evidencia suficiente para afirmar que tanto apego como identificación parecen seguir este tipo de distribución (Bernardo y Palma-Oliveira, 2013, 2016; Hernández et al., 2007; Hidalgo y Hernández, 2001).

Tal y como ha sido expuesto en la introducción de este documento, el profesor Korpela y sus colaboradores/as han trabajado extensamente acerca del potencial restaurador de los lugares favoritos. Una de las premisas de sus primeros trabajos es que la vivencia de experiencias restauradoras en lugares específicos refuerza el uso de dicha estrategia de regulación emocional y cognitiva y marca, en parte, el establecimiento de un vínculo afectivo e identitario con dicho lugar (Korpela y Hartig, 1996; Korpela, 1989). Trabajos más recientes han estudiado la relación entre restauración y vinculación psicológica desde otra perspectiva, entendiendo que los niveles de apego e identificación con un lugar podría incrementar los beneficios restauradores obtenidos al entrar en contacto con el mismo (Morton et al., 2017; Ratcliffe y Korpela, 2016, 2017; Wilkie y Clouston, 2015; Wilkie y Stavridou, 2013). Estos niveles configurarían, en parte, la relevancia del lugar para la persona y, teóricamente, podrían hacer la experiencia de restauración más profunda y significativa.

Los estudios incluidos en el segundo bloque de este trabajo aportan evidencia positiva relacionando el apego y la identificación con el espacio en los beneficios restauradores que se obtienen a través del mismo. Tal y como puede observarse en la tabla 8.3, los resultados de dichos estudios muestran correlaciones medias y altas entre apego y restauración y entre identificación y restauración, si bien éstas últimas son algo menores en tamaño. A nivel general esto indicaría que, a mayor nivel de vinculación psicológica con un determinado espacio, mayores cotas de restauración al visitarlo, siendo esta interpretación consistente con lo planteado en las investigaciones citadas al final del párrafo anterior.

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Asimismo, se realizaron análisis de regresión lineal que permitieron evaluar la asociación de dicho par de variables con la restauración obtenida con mayor control estadístico. De esta forma encontramos que el apego mantenía su asociación aún en presencia de la medida de identificación. Igualmente, la asociación entre identificación y restauración mantenía su menor tamaño cuando resultaba significativa. Se observa fácilmente en la tabla 9.3 que, si bien la relación entre apego y restauración es consistente en los tres estudios aquí referidos, no sucede lo mismo en el caso de la identificación. La tercera de estas variables se ha encontrado negativamente asociada a la restauración en el capítulo 5 (lugar 2), ha mostrado un funcionamiento desigual para contextos naturales y urbanos en el capítulo 6 y no ha resultado significativa en los capítulos 5 (lugares 1 y 3) y 7.

A pesar de que puedan encontrarse componentes de ambos tipos en cada constructo, la literatura parece señalar que el apego al espacio es de marcado carácter emocional y que la identificación, sin embargo, presenta una naturaleza de corte más cognitivo- Si hubiese de mantenerse la plausibilidad de la relación entre identificación y restauración, podría argüirse que quizá la medida de restauración utilizada recoge un mayor número ítems de tipo afectivo. El estudio de la tabla 5.1 (véase pág.143) permite comprobar esta hipótesis. Como puede extraerse, no hay una preponderancia de los ítems que aluden a experiencias de tipo afectivo (ítems 1, 2, 3; p.ej. *después de estar aquí me siento más tranquilo/a*) sobre los de orientación cognitiva (ítems 4, 5 y 6; p.ej. *venir aquí es una forma de despejar y aclarar mis pensamientos*). De hecho, los ítems específicamente añadidos a la adaptación española de la ROS, que incluyen contenidos de reflexión y trascendencia, presentan una formulación bastante cognitiva (*en*

este lugar tomo distancia de las cosas que me suceden y las veo desde una nueva perspectiva y aquí suelo pensar acerca de mis prioridades y objetivos en la vida).

Tabla 8.3.
Correlaciones y regresiones entre las puntuaciones de apego, identificación y restauración por estudio

Análisis correlacionales		
Estudio	$r_{\text{apego-restauración}}$	$r_{\text{identificación-restauración}}$
Capítulo 5	.588** - .842**	.356** - .575**
Capítulo 6	.384** - .726**	.073 - .636**
Capítulo 7	.760**	.564**

Análisis de regresión		
	β_{apego}	$\beta_{\text{identificación}}$
Capítulo 5	0.50*** - 0.83***	-0.16* (0.14, -0.06)
Capítulo 6	0.26** - 0.32***	-0.19** - 0.15*
Capítulo 7	.26***	0.01

Nota: * = valor $p < .05$, ** = valor $p < .01$, *** = valor $p < .001$. Entre paréntesis, en la columna de identificación se muestran las betas no significativas de los modelos 1 y 3 respectivamente.

Continuando con esta línea de análisis, podría plantearse también que quizá la medida de identificación con el espacio no sea lo suficientemente completa y que no recoja la totalidad de los contenidos del constructo. Ciertamente, de los 9 ítems originales de la escala de Apego e Identificación con el barrio (Ruiz et al., 2011), tan solo tres pertenecen a este constructo. Además de lo anterior, dos de dichos ítems presentan una formulación muy similar: *siento que pertenezco a este lugar* y *siento que soy*

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de este lugar. En el proceso de validación de la escala se desechó un ítem para este factor cuya recuperación no permitiría incrementar el contenido del constructo ya que es parecido al tercero de los ítems del factor (*me identifico con mi barrio*). En una investigación reciente (Subiza-Pérez et al., *en revisión*) se optó por incluir dos ítems más para tratar de recoger un mayor contenido: 1) *este lugar significa mucho para mí* (extraído de Kyle, Graefe, y Manning, 2005) y 2) *este lugar es importante para mí* (elaboración propia).

Es posible que estos resultados se expliquen por la utilización de una medida de identificación con un espacio en particular. Teniendo en cuenta que, siguiendo a Bernardo y Palma-Oliveira (2013), las personas poseen identidades múltiples que van activándose en función del contexto, quizá la experiencia de un determinado espacio active no solo la identificación con el mismo sino identidades de carácter supra-ordinado en las que dicho espacio también esté incluido. Por ejemplo, en el estudio 7, es posible que la plaza Katalunia sustente además de la identidad “usuario/a de plaza Katalunia”, las identidades de *grosetarra* o donostiarra. Por tanto, la inclusión de las diferentes categorías o identidades sociales que puedan estar sustentadas por un determinado espacio, permitiría evaluar mejor el papel de esta variable en el proceso restaurador.

De una forma u otra, en esta tesis encontramos que la identificación con el espacio no funciona de forma tan consistente y clara en la predicción de los beneficios restauradores. Su descarte como variable predictora o influyente en el proceso de restauración no es recomendable en este momento habida cuenta de otros estudios que si han encontrado una relación positiva entre ambas variables (Knez et al., 2018; Knez y Eliasson,

2017; Knez et al., 2018; Morton et al., 2017; Wilkie y Clements, 2018; Wilkie y Clouston, 2015; Wilkie y Stavridou, 2013; Ysseldyk et al., 2016).

Por tanto, los resultados aquí obtenidos han de tomarse con cautela y se recomienda replicar y profundizar en este tipo de estudios para llegar a conclusiones más asentadas.

A modo de cierre, podría extraerse que los estudios presentados en los capítulos 4 a 7 vendrían a apoyar la nueva corriente de estudios relacionando vinculación y restauración (véanse págs. 26-30). Sin embargo, debido a la naturaleza de los diseños empleados en esta tesis no podemos concluir qué aproximación es más válida, o, dicho de otra forma, qué es antes: si la vinculación o la experiencia de restauración. Tampoco este punto correspondía con ninguno de los objetivos de esta tesis (véanse págs. 33-38). Sin embargo, a nivel teórico-conceptual es claro que desde el mismo momento en el que una persona entra en contacto con un espacio, éste podría otorgarle beneficios restauradores. Asimismo, este momento podría significar el comienzo de la construcción de un vínculo psicológico de mayor o menor calado. Por otra parte, quizá un espacio que no resulte restaurador en un inicio sea capaz de otorgar experiencias restauradoras una vez se alcance un determinado grado de vinculación, permitiendo por ejemplo recomponer historias vitales a través del mismo o estableciendo conexiones pasado-presente-futuro. Para dar respuesta a esta pregunta, que en ningún caso era objetivo de esta tesis doctoral, habrían de plantearse estudios experimentales de corte longitudinal que permitieran analizar el desarrollo de la vinculación hacia espacios restauradores.

8.3 Síntesis general de conclusiones utilizando el modelo *Person-Process-Place*

8.3.1 El modelo tripartito de apego al espacio de Scannell y Gifford

Scannell y Gifford (2010) propusieron en uno de sus trabajos un modelo de organización conceptual del apego al lugar. El hecho de reunir los desarrollos teóricos y la evidencia disponible acerca de dicho constructo era visto por dichos autores como un medio útil para el desarrollo del área de estudio y el avance científico en la materia. La figura 8.1. extraída de dicho artículo, muestra gráficamente el modelo. Según explican, el primero de los factores, *person*, recoge a las personas o grupos sujetos del vínculo persona-espacio. Por su parte, el apartado de *process* incluye las diferentes manifestaciones de este vínculo tanto de corte afectivo (p.ej. amor, orgullo o bienestar) como cognitivo (p.ej. recuerdos, cogniciones o evaluaciones) y conductual (p.ej. búsqueda de proximidad, conducta de retorno o reconstrucción de lugares). En última instancia, bajo el epígrafe de *place* se agrupan aquellas características sociales (p.ej. relaciones sociales, sentido de comunidad o nacionalismo) y físicas (p.ej. elementos naturales o contruidos) que definen el espacio con el que una persona o grupo ha establecido el vínculo afectivo. Este modelo podría servir por tanto para la síntesis conceptual, el mapeo de los diferentes estudios realizados y sus principales resultados, así como para la detección de lagunas en el corpus teórico y la organización de futuros esfuerzos de investigación.

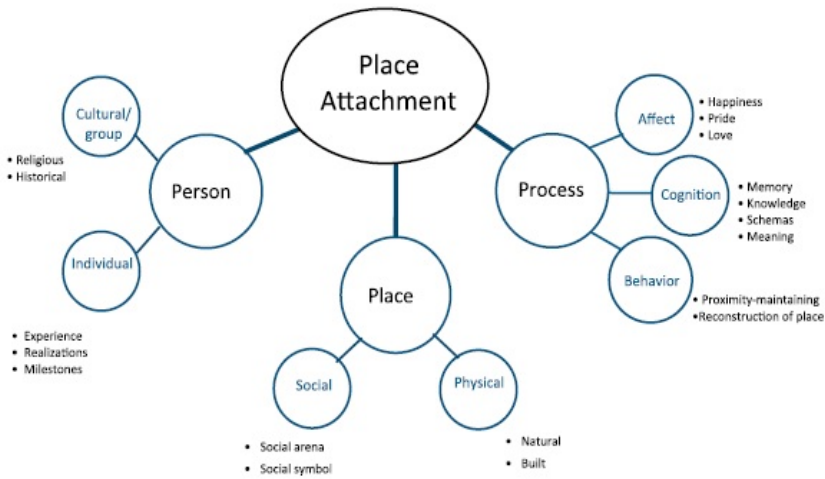


Figura 8.1. Modelo tripartito de apego al espacio planteado por Scannell y Gifford (2010).

8.3.2 Propuesta de un modelo tripartito para la restauración psicológica

Tal y como se propone en Subiza-Pérez y colaboradores (2018; p.11), la aplicación de este modelo al campo de la restauración también podría resultar útil. De hecho, bien mirado, se trataría de una propuesta válida para el estudio de cualquier proceso psicoambiental. La utilización de este tipo de modelos organizativos ha sido fuertemente recomendada para tales fines (Korpela, 2012). A continuación, y a modo de ejercicio teórico, se presentará una versión adaptada del modelo PPP que será luego utilizada para sintetizar los resultados obtenidos y las conclusiones extraídas de todos los estudios incluidos en esta tesis doctoral. La figura 8.2., muestra el modelo en cuestión.

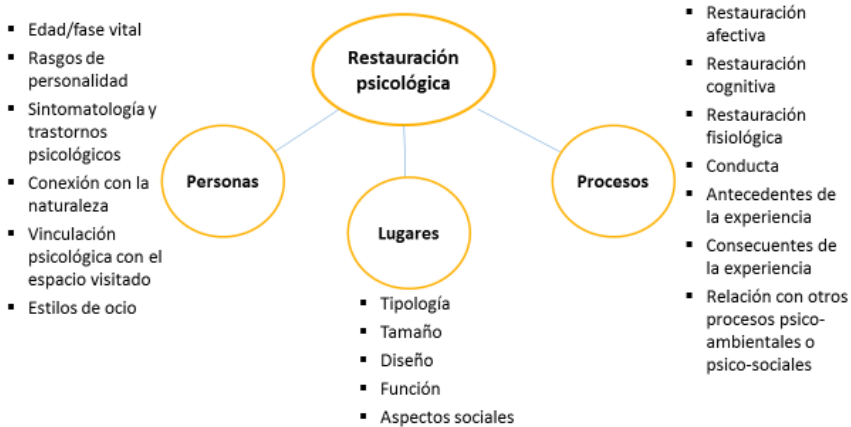


Figura 8.2. Modelo tripartito de restauración psicológica adaptado de Scannell y Gifford (2010).

Como puede observarse en esta figura, el modelo recoge la misma estructura básica que el modelo original de Scannell y Gifford; persona-proceso-lugar. Sin embargo, los contenidos propios de cada uno de dichos factores han sido extendidos y actualizados para el propósito que nos ocupa. También se ha decidido poner en plural los nombres de los tres factores para reflejar y enfatizar la multiplicidad de elementos personales y procesuales que pueden verse implicados en las experiencias de restauración así como los diferentes lugares en los que éstas podrían darse y los variados aspectos de los mismos que podría estar implicados. A continuación, se realizará un breve recorrido no exhaustivo con ejemplos de la literatura propia de los espacios restauradores para ir desarrollando cada uno de los factores y así dar cuenta de los posibles usos de este modelo. Posteriormente, y dentro de cada apartado, los resultados de esta tesis doctoral serán añadidos.

Las personas

Dentro de la sección *personas*, se recogerían todas aquellas investigaciones y resultados que informasen acerca de la influencia de diversos factores personales en el proceso de restauración. En este sentido, hay variados ejemplos en la literatura reciente que pueden resultar informativos. En referencia a la edad o la fase vital en la que se encuentren las personas, un estudio evidenció que las personas jóvenes, adultas y mayores diferían en los espacios que elegían para restaurarse, el tiempo que dedicaban a dicha actividad y la compañía social con la que la realizaban (Scopelliti y Vittoria Giuliani, 2004).

En cuanto a los rasgos de personalidad, un caso relativamente recurrente en la literatura y que resulta plausible y coherente es el de la conexión con la naturaleza. Se ha encontrado que la conexión con la naturaleza se halla positiva y significativamente asociada a la restauración percibida en contextos naturales (Berto et al., 2018; Tang et al., 2015). Otra posibilidad, ampliamente abordada en este trabajo, es la inclusión de variables de vinculación psicológica con los espacios restauradores (Knez et al., 2018; Ratcliffe y Korpela, 2016, 2017).

Algunos/as autores/as han señalado igualmente que rasgos de personalidad clásicos, como el neuroticismo, podrían estar también relacionados con la experiencia de restauración. Por ejemplo Johnsen encontró en su estudio publicado en 2013 que participantes con mayores niveles del rasgo neuroticismo de la escala de los cinco grandes, reportaron mayor restauración en términos de recuperación de fuerza de voluntad tras realizar actividades en espacios naturales. En esta misma línea se ha

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encontrado que este mismo rasgo está relacionado con evaluaciones más bajas del potencial restaurador de espacios urbanos y naturales (Felsten, 2014) y de domicilios personales (Meagher, 2016). Desde un punto de vista más global, un interesante trabajo comparó la experiencia de restauración de personas con alta y baja salud psicológica, encontrando que los segundos obtenían tasas de restauración más altas (Roe y Aspinall, 2011). De igual forma, algunos estudios han evaluado el potencial restaurador de intervenciones en espacios naturales con muestras clínicas (Berman et al., 2012; Vujcic et al., 2017).

La aportación principal de esta tesis doctoral dentro de este apartado ha sido el estudio de la relación entre variables de corte individual, como son el apego y la identificación con el espacio en la obtención de beneficios restauradores. A través de los estudios de esta tesis doctoral se ha encontrado de forma consistente que el apego con un determinado lugar se asocia significativamente a sus beneficios restauradores. Específicamente, a mayor vínculo afectivo con un determinado lugar, mayores son los niveles de restauración recordada (capítulo 5), imaginada/evaluada (capítulo 6) o experimentada (capítulos 4 y 7). En el caso de la relación entre restauración e identificación, los resultados son menos consistentes. Tal y como puede verse en la tabla 8.3., ambas variables se han mostrado correlacionadas de forma positiva en la mayoría de ocasiones. Sin embargo, cuando se han construido modelos de regresión para testar dicha asociación en presencia de otras variables, la imagen emergente ha sido bien distinta.

En el capítulo 5 se mostró cómo identificación y restauración estaban negativa y significativamente asociadas cuando se pidió a una muestra de participantes que las reportaran en referencia a espacios que utilizasen con

frecuencia en su vida cotidiana hacia el que tuvieran un nivel de preferencia medio (capítulo 5: lugar 2). Esto sucedió aún en presencia de la medida de apego al espacio. Sin embargo, en este mismo capítulo, la identificación mostró una tendencia positiva cercana al nivel de significación ($p = .067$) para el lugar preferido. En el capítulo 6 vimos cómo la identificación funcionó como predictora de los beneficios restauradores esperados en el contacto con el paisaje natural autóctono y el urbano autóctono. Sin embargo, el signo de esta predicción era positivo para el paisaje natural y negativo para el urbano. Por último, esta variable no se encontró asociada a los beneficios restauradores, en presencia de otras variables de corte psicológico y ambiental, cuando se evaluó la restauración obtenida en plazas urbanas (capítulo 7).

Esto nos lleva a concluir que 1) apego e identificación se asocian significativamente a restauración, 2) que dicha asociación es mayor en el caso del apego, 3) que la relación entre apego y restauración es significativa y positiva incluso en presencia de otras variables y, 4) que la identificación muestra un funcionamiento más complejo en su relación con la restauración, tal y como se ha explicado en el párrafo anterior. En su conjunto, estos resultados son importantes en la medida en la que enfatizan el rol de las variables personales en la experiencia de restauración que, tal y como se ha comentado en varias ocasiones a lo largo de este trabajo, ha recibido poca atención.

Los procesos

El modelo aquí propuesto serviría para recoger también la diversidad de procesos implicados en la restauración psicológica. Atendiendo a los

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planteamientos básicos de la ART y la SRT, es evidente que han de seguir estudiándose los efectos de las experiencias restauradoras en las esferas cognitiva y afectiva. Pero también, tal y como se apuntaba en el primer capítulo del bloque 1 de este trabajo, la expansión hacia nuevos tipos de medidas posibilitaría una mejor y más profunda comprensión de este fenómeno psicológico que pudiera conducir a más y más variadas aplicaciones prácticas. Ejemplos de ello son los ya citados trabajos midiendo la influencia de la exposición a entornos restauradores en la prosocialidad (Joye y Bolderdijk, 2015; Zelenski et al., 2015) o la creatividad (van Rompay y Jol, 2016).

Dentro del apartado de la conducta merecería la pena detenerse un poco más. En primer lugar, ya ha sido señalado anteriormente (véase capítulo 1) que la gran mayoría de estudios de restauración, sobre todo los de medidas pretest y posttest, han recurrido a actividades como la contemplación y el paseo. Los trabajos incluidos en los capítulos 3 y 4 son un buen ejemplo de estudio de otro tipo de actividades que pudieran propiciar ciertas tasas de restauración y cuyo análisis podría igualmente llevar a aportaciones de tipo básico y aplicado a esta disciplina. En esta misma línea, estudios recientes han comenzado a estudiar si la utilización de técnicas de meditación y *mindfulness* incrementa los niveles de restauración obtenida (Lymeus, Lindberg, y Hartig, 2018; Lymeus, Lundgren, y Hartig, 2017) o si podría hacerlo el seguimiento de instrucciones o la realización de tareas específicas durante la actividad (Korpela, Savonen, Anttila, Pasanen, & Ratcliffe, 2017; Pasanen, Johnson, Lee, & Korpela, 2018).

Además del tipo de actividades, el estudio de la influencia de la frecuencia de realización de las mismas en la restauración obtenida y en

otros indicadores de salud podría resultar de interés. Esto último conduce directamente al todavía vigente debate sobre la dosis de contacto requerida con espacios o actividades restauradoras para la experiencia de beneficios psicológicos. La literatura sobre *green exercise* se ha detenido quizá con mayor dedicación a estudiar este tema. Por citar un par de ejemplos podríamos destacar el trabajo de Barton y Pretty (2010) que apuntaba a que algunos efectos positivos de esta conducta se distribuían de forma curvilínea, con picos en los primeros minutos de exposición y para las actividades de larga duración (día entero). En esta línea, en otro estudio que analizó la experiencia de restauración de corredores/as en un parque urbano se encontró que la duración de la carrera predecía parte de los cambios en sensaciones de tranquilidad y revitalización (Szabo y Abrahám, 2013).

Bajo este epígrafe también habría que agrupar aquellos estudios que han tratado de evaluar el posible efecto de la compañía social en la consecución de experiencias restauradoras (Hartig y Staats, 2006a; Johansson et al., 2011; Korpela, Borodulin, Neuvonen, Paronen, y Tyrväinen, 2014; Staats y Hartig, 2004; Staats et al., 2016). Otro aspecto a incluir para la mejor comprensión del proceso de restauración es el estudio del estado psicológico previo a dicha experiencia. En este sentido, diversos trabajos mostraron que los estados de fatiga atencional³² modificaban los patrones de preferencia y percepción de restauración de entornos naturales y urbanos (Hartig y Staats, 2006b; Staats y Hartig, 2004; Staats et al., 2003).

³² Por favor, consúltense Berto et al. (2010), Chiang, Li y Jane (2017), Chow y Lau (2014) y van den Berg et al (2003) como ejemplos de estudios que han inducido fatiga atencional antes de exponer a los/as participantes a tratamientos ambientales.

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Por último, dentro de esta sección también podrían incluirse contenidos acerca de la relación de los procesos restauradores con otros procesos psico-ambientales o psico-sociales, que pudieran estar relacionados con el mismo, aparecer de forma conjunta o funcionar en ocasiones como antecedentes o consecuentes. Ejemplos de ello serían las experiencias estéticas ambientales (Subiza-Pérez, Hauru, Korpela, Haapala, & Lehvävirta, *under review*; Ulrich, 1983), el miedo (Herzog y Rector, 2008; Herzog y Chernick, 2000) o el desarrollo de vínculos psicológicos con los lugares restauradores (Main, 2013; Sampson y Gifford, 2010).

La principal aportación de este trabajo al apartado de *procesos* dentro del fenómeno de la restauración es el estudio del potencial restaurador de actividades diferentes. Si la restauración psicológica es el resultado de interacciones persona-ambiente, la actividad que se realiza se encuentra justo en el centro de dicho contacto y por tanto sus características habrían de estar íntimamente relacionadas con los resultados de dicho contacto.

En el primer capítulo del bloque 1 se exponía que la gran mayoría de estudios pretest-posttest de campo se han centrado en la evaluación de dos actividades, el paseo y la contemplación. Los estudios presentados en los capítulos 3 y 4 han permitido explorar el potencial restaurador de actividades que se pueden realizar de forma sencilla en espacios urbanos y cuyo fomento podría ser relevante en materia de salud pública y con un coste relativamente bajo. Se encontró que la marcha nórdica producía en las personas participantes importantes mejoras en términos afectivos y que dicha actividad propiciaba en cierta medida algunas de las características definitorias de las experiencias de restauración. Lo mismo sucedió en el

estudio presentado en el capítulo 4, en el que se evidenció que dos actividades al aire libre (taichí-yoga y gimnasia-zumba) propiciaron también restauración en términos afectivos.

Por último, el estudio de encuesta incluido en el capítulo 7 permitió observar cómo algunas de las actividades realizadas en las plazas por las personas usuarias mantenían una correlación positiva con la experiencia de restauración psicológica (p.ej. pasear y leer) mientras que cuidar de niños/as o personas dependientes correlacionaba de forma negativa. Todo esto no viene sino a reforzar la idea del papel mediador de las actividades en la relación entre personas y espacios restauradores e invita por tanto a seguir explorando en esta línea.

Los lugares

En la figura 8.2. aparecen una serie de variables o dimensiones a tener en cuenta para organizar los conocimientos, estudios y futuras líneas de investigación respecto a las características propias de los espacios restauradores. En primer lugar podría atenderse a la tipología de espacio cuyo potencial restaurador ha sido evaluado. La literatura abunda en el uso de bosques (Bielinis et al., 2017; Park et al., 2010; Tsunetsugu et al., 2013) y parques (Berman et al., 2008; Gatersleben y Andrews, 2013; Hartig et al., 2003; Tyrväinen et al., 2014), aunque cada vez se están incluyendo más tipos de espacios. Por ejemplo, estudios recientes han analizado el potencial restaurador de centros históricos (Fornara, 2011; Stigsdotter, Corazon, Sidenius, Kristiansen, y Grahn, 2017), calles (Bornioli, Parkhurst, y Morgan, 2018), plazas y pequeños espacios verdes (Lorenzo et al., 2016; Nordh y Østby, 2013; Peschardt et al., 2014), tejados verdes (Lee, Williams, Sargent,

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Williams, y Johnson, 2015) cafeterías y bares (Staats et al., 2016) o incluso clases de escuela (van den Berg, Wesselius, Maas, y Tanja-Dijkstra, 2017) o cementerios (Nordh, Evensen, & Skår, 2017). Asimismo, dentro del contexto de una sociedad cada vez más tecnologizada, el estudio del potencial restaurador y psicológico de entornos virtuales o digitales promete ir adquiriendo cada vez más protagonismo (Truong et al., 2018).

Evidentemente, todas estas tipologías de lugares llevan asociadas las diversas funciones que ostentan dichos lugares: recreo, esparcimiento y contacto social para parques, plazas y bares, desplazamiento para las calles, estudio y/o trabajo para entornos educativos o laborales por citar algunos ejemplos. Sin embargo, sus atributos físicos tales como el tamaño (Nordh et al., 2009), su configuración psicoambiental (Gatersleben y Andrews, 2013), el mantenimiento (Martens et al., 2011) o la presencia y densidad de elementos vegetales (Chiang et al., 2017) habrían de tener cabida también. Por último, igualmente habría de considerarse el papel del paisaje social, es decir, de la presencia y conducta de otras personas en el espacio utilizado en la experiencia de restauración resultante (Dixon & Durrheim, 2004; Nordh et al., 2011).

De igual forma, si bien los elementos tradicionalmente asociados a las experiencias de restauración en contextos naturales (p.ej. vegetación o masas de agua...) han de ser considerados también para el estudio de este fenómeno en contextos urbanos, quizá sea necesario analizar el valor de otros elementos puramente urbanos o construidos que podrían resultar restauradores. En un estudio publicado por Lindal y Hartig (2013) se encontró, por poner un ejemplo, que la altura de los edificios se correlacionaba negativamente con la percepción de restauración en

entornos residenciales. En cambio, la percepción de restauración fue mayor al incrementarse la diversidad de los contornos y texturas de los edificios.

Dentro del apartado de los lugares, en esta tesis se ha realizado un esfuerzo para estudiar el potencial restaurador de las plazas urbanas, entendiendo que esta tipología urbana, dadas sus características de diseño y uso, podría también ofrecer beneficios restauradores a sus usuarios/as.

Los resultados del estudio presentado en el capítulo 2 de este trabajo informan de su valor restaurador, ya que las personas participantes vieron incrementada su capacidad atencional y su bienestar afectivo tras pasar media hora en una de las plazas seleccionadas. Esto es especialmente relevante al haberse observado un patrón de restauración comparable al de otros estudios que han utilizado escenarios más verdes o naturales. En el caso del estudio de percepción del paisaje (capítulo 6), las puntuaciones que recibieron los paisajes urbanos fueron ciertamente inferiores a las de los paisajes naturales, indicando que las personas participantes percibían un potencial restaurador limitado para esta tipología urbana. En el capítulo 7, se informó de puntuaciones de restauración medias para un set de 6 plazas urbanas, éstas recibieron puntuaciones medias, lo cual parece apuntar en la misma línea.

Los resultados de estos dos últimos estudios han de interpretarse con cautela. Con los datos recogidos en esta tesis, y la comparación con otros estudios, hemos vuelto a constatar que los espacios urbanos seleccionados han recibido por norma puntuaciones de restauración menores que los naturales. Una lectura superficial de esto llevaría a mantener la tradicional visión dicotómica naturaleza-ciudad. No obstante, el hecho de que las plazas

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aquí utilizadas hayan recibido puntuaciones menores no implica *per se* que no sean espacios restauradores o que, incluso, no sean de los escenarios urbanos con mayor potencial restaurador. De hecho, los resultados aquí obtenidos apuntan a que sí pueden otorgar ciertas cotas de restauración. Así, para enmarcar correctamente el potencial restaurador de las plazas urbanas, habría de incluirse en futuros estudios otras tipologías de espacios. En esta línea, el estudio de las opciones de restauración en entornos urbanos se beneficiaría y mucho del estudio de lugares interiores. Algunas investigaciones ya lo han hecho, al menos de forma preliminar, para el caso de cafeterías y bares (Staats et al., 2016), monasterios y lugares de oración (Herzog, Ouellette, Rolens, y Koenigs, 2010; Ouellette, Kaplan, y Kaplan, 2005) y museos (Kaplan, Bardwell, y Slakter, 1993; Mastandrea et al., 2018).

En segundo lugar, y tal y como se apuntaba en el capítulo 7, aún en el caso de que los espacios abiertos urbanos o construidos siempre fuesen menos restauradores, esto no habría de desmotivar una profundización en su estudio. En un contexto de densificación urbana como en el que vivimos (Thwaites y Simkins, 2005; van den Berg et al., 2007) y habida cuenta de la dificultad para insertar espacios verdes de gran extensión o incluso para realizar intervenciones ambiciosas de "verdificación" urbana, la potenciación de los valores restauradores y psicológicos de los espacios urbanos construidos se revela como una estrategia importante para la mejora de la calidad de vida urbana.

Este trabajo, con sus aciertos y limitaciones, ha pretendido contribuir a esta línea de investigación y reflexionar sobre algunos de los interrogantes actuales en materia de planeamiento urbano y diseño de las ciudades en las que vivimos.

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ANEXO I

El contenido de este anexo ha sido aceptado para su publicación en *Psycology*: Subiza-Pérez, M., Vozmediano, L., & San Juan, C. Diseño de una herramienta de observación social sistemática del potencial restaurador de espacios urbanos.

1. Introducción³³

1.1. *Las observaciones sociales sistemáticas*

Los procedimientos de observación social sistemática se desarrollaron originalmente dentro de la sociología criminológica para recoger información acerca de las características físicas y funcionales de un determinado entorno urbano (Schaefer-McDaniel, Dunn, Minian, y Katz, 2010). Tradicionalmente, la unidad de observación utilizada ha sido el barrio o distrito, aunque la literatura también recoge ejemplos de otras unidades como segmentos de calle (Clifton, Livi Smith, y Rodriguez, 2007) o espacios recreativos (Cavnar et al., 2004). Normalmente, un grupo de evaluadores/as expertos/as evalúa y codifica las características del espacio objeto de estudio bien presencialmente o a través de fotografías o vídeos. En la actualidad se utilizan mayoritariamente para evaluar la influencia de determinados aspectos físicos y sociales en diferentes variables asociadas a la salud y el bienestar.

A la hora de estudiar la relación entre variables objetivas u objetivables del entorno y aspectos relacionados con la salud, se suele recurrir a diseños de encuesta, estudios censales y administrativos e incluso Sistemas de Información Geográfica (SIG). Estas alternativas presentan problemas o limitaciones específicas (Schaefer-McDaniel, O'Brien Caughy, O'Campo, y Gearey, 2010). Es difícil obtener muestras representativas para las encuestas y éstas además pueden verse afectadas por la deseabilidad social. Los datos censales y administrativos suelen ser limitados dada la

³³ Las referencias citadas a lo largo de este texto se han añadido a la sección bibliográfica de esta tesis doctoral (véanse págs. 241-290).

ANEXO I

inespecificidad de la información que suele recogerse (renta, nivel educativo, nº de residentes en domicilio...) y presentan problemas ya que las demarcaciones administrativas no coinciden, en ocasiones, con las demarcaciones objetivas o subjetivas de los barrios. Por último, se ha señalado que las metodologías SIG tienden a obviar la presencia o ausencia de características específicas de los entornos que se evalúan más allá de los índices genéricos, por ejemplo, de presencia vegetal (Gidlow et al., 2018).

Las Observaciones Sociales Sistemáticas (OSS) permiten salvar algunas de estas limitaciones, pudiendo evaluarse un mayor set de variables que las recogidas en los censos e informes administrativos y evitar los sesgos que puedan padecer las respuestas de las personas encuestadas. Se han desarrollado instrumentos destinados a evaluar la presencia de elementos relacionados con la vida activa (Hoehner, Ivy, Ramirez, Handy, y Brownson, 2007), la caminabilidad (Clifton et al., 2007) o la seguridad urbana (Minnery y Lim, 2005). La herramienta *Exodes*, desarrollada en Barcelona, mide variables de corte físico y social relacionadas con la inseguridad y el uso de espacios urbanos abiertos (Valera et al., 2018). En una extensa revisión, Nickelson y colaboradores (Nickelson, Wang, Mitchell, Hendricks, y Paschal, 2013) detectaron un total de 20 dominios recurrentes (por ejemplo desorden físico, usos del espacio y paisaje/elementos naturales) en este tipo de herramientas a pesar de estar originalmente destinadas a la medición de constructos distintos.

1.2 Restauración psicológica y OSS

La restauración psicológica es el proceso de recuperación de los recursos físicos, psicológicos y sociales que se ven disminuidos ante las diferentes

demandas cotidianas (Hartig, 2004). Las principales teorías en esta línea de trabajo mantienen que el contacto con entornos que cumplan determinadas características facilitarían la recuperación de la fatiga atencional y el estrés emocional (Kaplan y Kaplan, 1989; Ulrich, 1993). Dicho contacto propiciaría un mejor estado de ánimo y ciertas cotas de reflexión y trascendencia.

Este constructo se ha medido normalmente a través de escalas psicológicas cumplimentadas por personas que visitaban un determinado lugar, imaginaban o recordaban hacerlo o contemplaban fotografías o vídeos. La medida más ampliamente utilizada ha sido la *Escala de Restauración Percibida* (PRS: Hartig et al., 1997), de la que en castellano disponemos de una versión de cinco ítems (Negrín et al., 2017). Otras escalas similares son la *Escala de Componentes Restauradores* (Laumann, Gärling, y Stormark, 2001), la *Escala de Restauración* de Han (2003) o la *Escala de Percepción de Restauración Ambiental* (Martínez-soto y López-lena, 2010). También se ha adaptado al castellano la *Escala de Beneficios Restauradores* (Korpela et al., 2008) que recoge los principales efectos psicológicos de las experiencias restauradoras (Subiza-Pérez et al., 2017).

Recientemente se ha señalado la necesidad de profundizar en la descripción y análisis de los espacios restauradores (Subiza-Pérez et al., 2018). Sin embargo, los autores del presente trabajo solo hemos encontrado un ejemplo de OSS aplicada al campo de la restauración. Se trata de un estudio en el que las autoras recogieron ocho características sensoriales de los espacios verdes urbanos (Kragtig Peschardt y Stigsdotter, 2013). Dichas características (naturaleza, cultura, perspectiva, social, espacio, riqueza de especies, refugio y serenidad) fueron evaluadas por dos arquitectos/as del paisaje con ítems presentados en una escala Likert.

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El objetivo de este estudio es desarrollar una herramienta de OSS para evaluar el potencial restaurador de diferentes espacios urbanos. Entendemos que el desarrollo de tal instrumento posibilitaría interesantes desarrollos en el ámbito de la Psicología Ambiental y el planeamiento urbano. En la esfera teórica, permitiría evaluar el papel específico de los diferentes elementos físicos y sociales del espacio público en la restauración psicológica. Desde el punto de vista aplicado, permitiría auditar espacios públicos urbanos y proponer intervenciones de cara a incrementar su potencial restaurador.

1.3 Variables potencialmente relacionadas con la experiencia de restauración

Para desarrollar la herramienta se ha tratado de recoger todas aquellas variables que pudieran estar relacionadas con la experiencia de restauración en contextos urbanos. En primer lugar, el entorno o paisaje a evaluar debería ser estudiado desde una aproximación multisensorial, ya que la interacción persona-entorno no sucede únicamente en la esfera visual (Menatti y Casado da Rocha, 2016). Estudios recientes han puesto de manifiesto la importancia de las modalidades sensoriales del tacto, el oído o el olfato (Benfield, Bell, Troup, y Soderstrom, 2010; Ratcliffe, Gatersleben, y Sowden, 2016; Shaw, Coyle, Gatersleben, y Ungar, 2015). Además, partiendo de las referencias clásicas en *restauración* (Kaplan y Kaplan, 1989; Ulrich, 1993), la presencia y diversidad de elementos naturales presentes en la escena ha de ser recogida.

En cuanto al medio construido, la presencia de sendas y equipamiento (bancos y fuentes, por ejemplo), así como su adecuado

mantenimiento, facilitan el uso del espacio urbano (Carmona, Heath, Oc, y Tiesdell, 2003; p.161; Nordh et al., 2009 Williams y Green, 2001; p.4) y podrían resultar importantes facilitadores de la experiencia restauradora. La diversidad en usos del espacio y el diseño de los edificios, superficies y espacios han de ser también recogidos (Lindal y Hartig, 2013). Por contra, todo aquello que pudiera suscitar sentimientos de inseguridad o miedo reduciría el potencial restaurador de un espacio y ha de ser igualmente considerado (Herzog y Rector, 2008; Herzog y Chernick, 2000).

Igualmente, el paisaje social podría ser un factor facilitador o reductor de la experiencia restauradora (Dixon y Durrheim, 2004; Nordh, et al.2011). Dentro de este grupo podríamos encontrar a personas paseando, leyendo o practicando algún deporte, así como niños/as jugando, actividades todas ellas que pudieran despertar interés y experiencia de lejanía en la persona que las observa. Asimismo, la realización de conductas disruptivas por parte de otras personas usuarias podría tener una influencia negativa.

Finalmente, la inclusión de variables psico-ambientales como el misterio, la coherencia, la imaginabilidad o legibilidad, la perspectiva visual o el *enclosure* habrán de ser también tenidas en cuenta (Appleton, 1975; Kaplan y Kaplan, 1989; Lynch, 1960; Stamps, 2005).

2. Procedimiento

2.1. Objetivo

El objetivo de este trabajo es desarrollar una herramienta de OSS para la evaluación del potencial restaurador de espacios urbanos.

2.2. Desarrollo de la herramienta

La herramienta fue desarrollada mediante el siguiente procedimiento. Una búsqueda bibliográfica permitió recopilar un total de 39 herramientas OSS destinadas a una amplia variedad de constructos (véase Tabla 1).

Se extrajeron las definiciones de los factores de la Teoría de la Restauración de la Atención (ART en sus siglas en inglés; Kaplan y Kaplan, 1989); experiencia de lejanía, fascinación, extensión y compatibilidad. A continuación, se emparejaron dichos factores con los ítems de las diferentes escalas previamente mencionadas que recogieran su contenido en alguna medida (véase sección 1.2). Así, una vez definido cada factor, se listaron los diferentes aspectos físicos y sociales de los entornos urbanos que pudieran estar relacionados con cada uno de ellos. Posteriormente se extrajeron de las OSS aquellos dominios, sub-dominios o ítems que pudieran servir para operacionalizar cada uno de los factores. Cuando los elementos extraídos de otras OSS no eran suficientes para reflejar adecuadamente los aspectos propios de cada factor, se desarrollaron dominios, sub-dominios e ítems *ad hoc*.

Tabla 1.

Herramientas de Observación Social Sistemática consultadas para el diseño del IEPREU

Herramienta	Autores
1. African American Health Neighborhood Assessment Scale	(Andresen et al., 2008)
2. Irvine Minnesota Inventory	(Boarnet, Day, Alfonso, Forsyth, y Oakes, 2006)
3. St. Louis Audit Tool – Analytic Version	(Brownson et al., 2004)
4. St. Louis Audit Tool – Analytic Version	(Brownson et al., 2004)
5. Neighborhood Brief Observation Tool	(Caughy, O’Campo, y Patterson, 2001)
6. Pedestrian Environmental Data Scan	(Clifton et al., 2007)
7. Senior Walking Environmental Assessment Tool	(Cunningham, Michael, Farquhar, y Lapidus, 2005)
8. PIN3 Neighborhood Audit Instrument	(Evenson et al., 2009)
9. Field Manual Urban Design Measures for NYC	(Ewing, Handy, Brownson, Clemente, y Winston, 2006)
10. Sin nombre	(Foltête y Piombini, 2007)
11. Healthy Passages	(Franzini et al., 2009)

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Herramienta	Autores
12. Sin nombre	(Franzini, Caughy, Nettles, y O'Campo, 2008)
13. Neighborhood Inventory for Environmental Typology	(Furr-Holden et al., 2010)
14. Active Neighborhood Checklist	(Hoehner et al., 2007)
15. Victorian Lifestyle and Neighbourhood Environments Study	(Kamphuis et al., 2008)
16. Neighborhoods and Senior Health	(King, 2008)
17. Neighborhood Attributes Inventory	(Laraia et al., 2006)
18. Cohort Study of Young's Girls Nutrition, Environment and Transitions	(Leung, Gregorich, Laraia, Kushi, y Yen, 2010)
19. Sin nombre	(Loukaitou-Sideris, Liggett, Iseki, y Thurlow, 2001)
20.Safe Routes to School	(McMillan, 2007)
21. Senior Walking Environmental Audit Tool Revised	(Michael et al., 2009)
22.Crime Prevention Through Environmental Design	(Minnery y Lim, 2005)
23. St. Michael's Neighborhood Observation Data Collection Tool	(Parsons et al., 2010)

Herramienta	Autores
24. Block Environmental Inventory	(Perkins, Meeks, y Taylor, 1992)
23. St. Michael's Neighborhood Observation Data Collection Tool	(Parsons et al., 2010)
24. Block Environmental Inventory	(Perkins et al., 1992)
25. Systematic Pedestrian and Cycling Environmental Scan Instrument	(Pikora, 2000)
26. Sin nombre	(Schaefer-McDaniel, 2009)
27. Systematic Pedestrian and Cycling Environmental Scan for Alleys Instrument	(Seymour, Reynolds, y Wolch, 2010)
28. Block Walk Method	(Suminski, Heinrich, Poston, Hyder, y Pyle, 2008)
29. Housing Environment Rating Scale- Neighborhood Quality	(Wright y Kloos, 2007)
30. Healthy Environments Partnership Neighborhood Observational Checklist	(Zenk et al., 2007)
31. Sin nombre	(Zhu y Lee, 2008)
32. Perceived Residential Environment Quality	(Bonaiuto, Fornara, y Bonnes, 2003)
33. Neighborhood Walkability Scale (NEWS)	(Saelens y Sallis, 2002)

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Herramienta	Autores
34. Project on Urban Development in Chicago Neighborhoods	(Molnar, Gortmaker, Bull, y Buka, 2004)
35. Neighborhood Active Living Potential	(Gauvin et al., 2005)
36. Residential Environment Assessment Tool	(Dunstan et al., 2005)
37. U Maryland Urban Design Tool	http://activelivingresearch.org/node/10635
38. Recreational Facility Evaluation Tool	(Cavnar et al., 2004)
39. Pedestrian Environment Quality Index	https://nacto.org/wp-content/uploads/2015/04/Pedestrian-Environmental-Quality-Index-Part-1.pdf

Nota: Las herramientas 1-31 corresponden a las analizadas por Nickelson et al.,(2013). Las herramientas 32-39 fueron encontradas por los autores de este artículo. En ausencia de una referencia bibliográfica conocida se refiere la página web donde fueron consultadas las herramientas 37 y 39.

La primera versión del instrumento fue probada por los autores de este artículo en tres parques y tres plazas de la ciudad en la que se realizó el estudio. El instrumento fue mejorado a través de las mejoras sugeridas tras dicha prueba piloto.

2.3. Estructura de la herramienta

La herramienta está compuesta por un total de y ciento ochenta y tres ítems y doce dominios. Dichos ítems se agrupan en los cuatro factores de la ART. Esta estructura aparece recogida en la Figura 1. Los ítems son *checklists* e

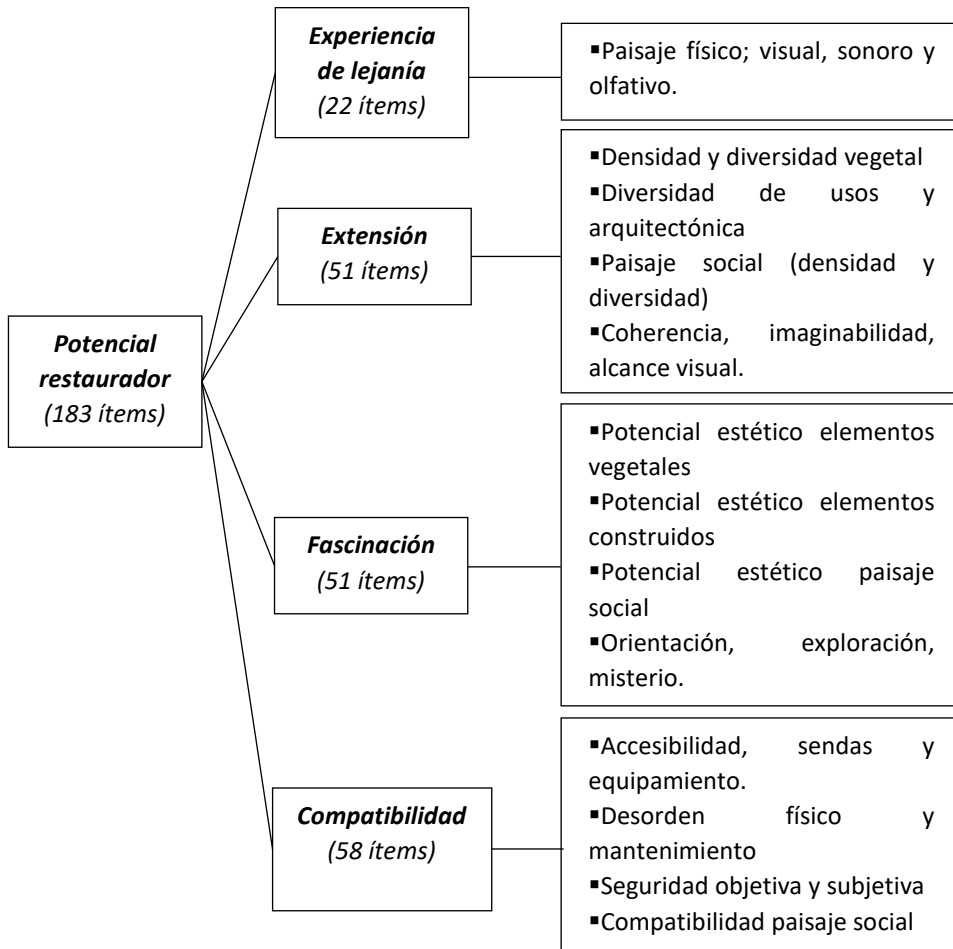


Figura 1. Estructura de puntuaciones del IEPREU.

ítems tipo Likert para evaluar la presencia de elementos dentro del espacio evaluado o el grado en el que el mismo cumple ciertas características.

El dominio *Acceso al espacio*, consta de cinco ítems acerca de las horas de apertura del espacio, la forma de acceso al mismo, la dificultad de acceso y uso por parte de personas con problemas de movilidad y las

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posibles áreas restringidas dentro del mismo. El segundo, *Presencia de elementos vegetales*, evalúa los niveles de presencia, diversidad y potencial estético de diversos elementos vegetales. A continuación, el dominio de *Paisaje físico* recoge ítems referentes a estímulos visuales, sonoros u olfativos (p.ej. masas de agua, cantos de pájaro o ruido de tráfico). Además de su presencia, la herramienta pregunta sobre el potencial estético o perturbador de dichos elementos

Los siguientes cinco dominios se dirigen al entorno construido. Los dominios cuatro y cinco (*Presencia elementos construidos* y *Diversidad arquitectónica* respectivamente) permiten evaluar los usos del espacio (p.ej. residencial o comercial) y el nivel de diversidad arquitectónica observable en los edificios. El dominio de *Equipamiento* evalúa la presencia y suficiencia de mobiliario urbano que pueda servir de soporte para el uso restaurador de la plaza (p.ej. bancos y fuentes). *Sendas* es una sección del instrumento referente a la naturaleza y estado de las vías que atraviesan el espacio. Por último, el octavo dominio (*Desorden físico*) recoge indicadores objetivos de desorden social presentes en la literatura (p.ej. grafitis, y basura) y de mantenimiento.

El dominio número nueve, *Seguridad*, incluye elementos de seguridad objetiva (señales o cámaras p.ej.) y subjetiva (vigilancia natural, permeabilidad visual y motora). El décimo apartado, *Indicadores psicoambientales*, agrupa una serie de variables clásicas en el análisis de espacios como la coherencia, la imaginabilidad, el enclosure o el misterio.

Los apartados once y doce están dedicados a las dinámicas sociales que suceden en el espacio evaluado. En primer lugar, *Paisaje Social* recoge

datos los datos demográficos y las actividades que las personas usuarias del espacio. Asimismo, incluye cuestiones acerca de la diversidad, compatibilidad y potencial de fascinación del paisaje social. Finalmente, el duodécimo dominio, *Desorden Social*, evalúa la posible presencia de individuos realizando conductas que pudiesen afectar negativamente a la experiencia de uso del espacio en cuestión, como las peleas o el consumo de drogas.

A propósito de la estructura del *IEPREU* ha de señalarse que si bien si bien la mayoría de sus ítems recogen elementos de carácter permanente o pseudo-permanente (como bancos, árboles o edificios), otros hacen referencia a elementos de naturaleza más efímera. Tal es el caso de la presencia de sonidos o personas que puede darse en determinadas franjas horarias y ser por tanto variable a lo largo del día y de la noche. Por tanto, se pueden distinguir atributos de tipo *estático* (los primeros) y *dinámico* (los segundos).

2.4. Procedimiento, muestra y recogida de datos

La versión definitiva fue utilizada por dos evaluadores y dos evaluadoras específicamente entrenados, siendo uno de ellos autor de este trabajo, en seis plazas urbanas (las mismas plazas urbanas que las utilizadas en el estudio presentado en el capítulo 7 de este trabajo, véase figura 7.1, pág. 194). Dicha evaluación se llevó a cabo en varias sesiones en horario de oficina y con buen tiempo. Para realizar un primer estudio de la validez de la herramienta se utilizó parte de los datos recogidos para el estudio presentado en el capítulo 7 de este trabajo. Específicamente, se utilizaron las puntuaciones de la *PRS* (Negrín et al., 2017) y la *Escala de Beneficios*

ANEXO I

Restauradores (ROS-S; Subiza-Pérez et al., 2017) de las 296 personas que componían la muestra.

2.5 Análisis de datos

El índice de acuerdo interjueces se calculó con el Intervalo de Correlación Intraclase (ICC). Este estadístico sirve para evaluar el acuerdo entre dos o más jueces (Hallgren, 2012; Shrout y Fleiss, 1979) y varía desde el -1 (desacuerdo perfecto) hasta el +1 (acuerdo perfecto)³⁴. Dado que todos los evaluadores evaluaron todos los espacios, se utilizó un modelo de dos vías y se hizo un análisis de consistencia utilizando las puntuaciones medias de cada espacio en las diferentes dimensiones del instrumento. Para evaluar la validez convergente se analizó las correlaciones (*r* de Pearson) del *IEPREU* con las dos medidas de restauración tomadas en el estudio de campo. Para este cálculo se han incluido únicamente las secciones estáticas del *IEPREU*. Los análisis estadísticos fueron realizados utilizando el *SPSS v.22*.

3. Resultados

3.1 Cálculo de la fiabilidad del instrumento

El ICC para cada factor del instrumento y sus subdominios principales aparece en la Tabla 2. Como puede observarse, tanto el instrumento en global como los cuatro factores principales obtuvieron muy buenos índices de acuerdo interjueces (.86 - .97). En el caso de los subdominios se produjo

³⁴ Siguiendo a Hallgren (2012), puntuaciones por debajo de .40 indicarían pobre nivel de acuerdo, entre .41 y .59 nivel justo y entre .60-74 bueno. Índices superiores a .75 serían síntoma de excelente nivel de acuerdo.

una tónica similar en la mayoría de los casos. Sin embargo, uno de ellos obtuvo una puntuación muy baja (Coherencia; .23).

Tabla 2.

Coefficiente de correlación intraclase por factor y subdominio del IEPREU.

Dominio	CCI
<i>Puntuación global</i>	.93
<i>Experiencia de lejanía</i>	.86
Paisaje visual	.90
Paisaje sonoro	.68
Paisaje olfativo	.96
<i>Extensión</i>	.86
Elementos vegetales	.98
Elementos construidos	.92
Diversidad arquitectónica	.80
Paisaje social	.77
Coherencia	.23
Imaginabilidad	.82
<i>Fascinación</i>	.97
Elementos vegetales	.94
Paisaje físico	.91
Elementos construidos	.98
Orientación	.91
Exploración	.56
<i>Compatibilidad</i>	.91
Accesibilidad	.69
Sendas	.84
Equipamiento	.57
Desorden físico	.74
Mantenimiento	.88
Seguridad objetiva	.67
Seguridad subjetiva	.92

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3.3. Correlaciones del IEPREU con las escalas PRS y ROS-S

La tabla 3 muestra las correlaciones de las puntuaciones de la herramienta con la versión corta de la PRS. Este índice estadístico aparece tanto para la puntuación global de la escala como para cada uno de los ítems que reflejan los diferentes factores de la ART. Se observan correlaciones significativas entre las puntuaciones globales de ambos instrumentos (PRS e IEPREU) así como entre algunos de sus factores. El tamaño de estas asociaciones es pequeño. Del mismo modo, la tabla 3 muestra las correlaciones del IEPREU con la ROS-S.

4. Discusión

Este estudio tenía como objetivo desarrollar una herramienta de OSS para evaluar el potencial restaurador de espacios públicos urbanos aplicando una teoría específica (ART; Kaplan y Kaplan, 1989). A nivel psicométrico el IEPREU ha mostrado un adecuado comportamiento en términos de fiabilidad, alcanzándose en la gran mayoría de factores y dominios unos niveles de acuerdo aceptables ($ICC > .70$). En el caso de los sub-dominios con menores grados de acuerdo, los autores lo achacan a la menor variabilidad de puntuaciones entre los espacios evaluados, factor muy influyente en este aspecto (Hallgren, 2012) y al hecho de que algunos elementos presentes en el espacio hayan podido pasar desapercibidos a alguna de las personas evaluadoras.

Tabla 3.
Correlaciones entre puntuaciones IEPREU, la versión corta de la PRS y la ROS-S

	IEPREU	Lejanía	Fascinación	Extensión	Compatibilidad
<i>PRS</i>					
<i>Puntuación global</i>	.155**	.112†	.115*	.176**	-
<i>Lejanía</i>	.146*	.135*	.111†	.183**	-
<i>Fascinación</i>	.141*	-	-	.183**	-
<i>Coherencia</i>	.166**	.142*	.108†	.162**	-
<i>Compatibilidad</i>	.109†	-	-	.132*	.119*
<i>Scope</i>	-	-	-	-	-
<i>ROS-S</i>					
<i>Puntuación global</i>	-	-	-	.141*	-
<i>Relajación y calma</i>	.121*	-	-	.198**	.139*
<i>Limpieza de pensamientos</i>	-	-	-	-	.119*
<i>Restauración de la atención</i>	-	-	-	-	-
<i>Reflexión</i>	-	-	-	-	.125*

Nota: solo se reportan las correlaciones estadísticamente significativas. †= valor $p < .10$; *= valor $p < .05$; **= valor $p < .01$. PRS = Escala de Restauración Percibida en sus siglas en inglés, ROS-S = Versión en castellano de la Escala de Beneficios Restauradores en sus siglas en inglés.

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La reducida asociación entre las puntuaciones de la herramienta y las medidas de restauración percibida y experimentada utilizadas es similar a otros casos descritos en la literatura. Por ejemplo índices objetivos de caminabilidad han explicado porcentajes de la varianza no mayores al 10%, teniendo otras variables psicosociales mayor poder predictivo (Frank et al., 2006; Frank, Schmid, Sallis, Chapman, y Saelens, 2005; Lee y Moudon, 2006). Asimismo, se ha afirmado que las teorías de la restauración fueron desarrolladas para entender este proceso de recuperación psicológica en contextos naturales y que por tanto, quizá sean limitadas para comprenderlo en contextos urbanos (San Juan et al., 2017; 11). Por ejemplo, el factor de *being away* se ha definido como la presencia de elementos no relacionados con los entornos generadores del estrés y la fatiga emocional. En el caso de los espacios naturales, se han solido considerar de esta forma los árboles, plantas y las masas de agua, elementos que se han recogido oportunamente en el *IEPREU*. Sin embargo, queda todavía por dilucidar qué elementos netamente urbanos o contruidos (p.ej. equipamientos, superficies, materiales, etc.) podrían generar experiencias de lejanía. Igualmente, a pesar de que se han incluido también dominios para tratar de registrar el potencial restaurador de los elementos contruidos (p.ej. diversidad arquitectónica), consideramos que queda mucho trabajo por hacer para discernir las cualidades específicas de la experiencia de restauración urbana (Cattell et al., 2008; Thwaites et al., 2011).

Desde el punto de vista de los autores, la principal aportación de este instrumento es la posibilidad de medir variables ambientales, tanto físicas como sociales, que podrían estar relacionadas con la experiencia de restauración urbana (Lorenzo et al., 2016). El *IEPREU* podría ser utilizado a

modo de *screening* para conocer el estado actual de diferentes espacios urbanos y detectar posibles áreas de mejora para incrementar su potencial en términos de restauración, uso y disfrute por parte de la ciudadanía. Dicho *screening* habría de repetirse en diferentes ocasiones en el caso de las secciones *dinámicas* del *IEPREU* (ver sección 2.3) para así captar convenientemente los fenómenos que pudiesen aparecer en franjas horarias determinadas.

Es por ello que sería recomendable utilizar las secciones “*dinámicas*” del *IEPREU* en más de una ocasión para captar mejor la aparición o no de dichos fenómenos o su posible distribución temporal. Una dificultad añadida de este tipo de estímulos es que podrían no ser percibidos por el conjunto del equipo evaluador. En el caso de los estímulos sonoros, esta última dificultad podría salvarse mediante el uso de dispositivos electrónicos.

A pesar de lo anterior, la metodología OSS presenta una serie de limitaciones que han de ser tenidas en consideración. La valoración de los/as jueces/as también se encuentra sujeta a posibles sesgos psicológicos (Schaefer-McDaniel et al., 2010, al igual que la conducta de las personas observadas (Valera et al., 2018). Dichos sesgos podrían ser salvados con entrenamiento y reuniones de seguimiento con los/as evaluadores/as. Por tanto, lo más adecuado en términos de rigor científico sería incluir datos provenientes de diferentes metodologías (OSS, encuestas, SIG, etc.) para desarrollar un mayor entendimiento de los fenómenos objeto de estudio. Ejemplo de ello es la utilización de una sección del *IEPREU* en estudios de campo sobre restauración urbana (San Juan et al., 2017).

5. Comentario final

Una de las áreas probablemente más deficitarias en el ámbito de la Psicología Ambiental es precisamente el desarrollo de materiales para la evaluación de espacios públicos, dado que éstos están conformados por diferentes dimensiones (Carmona et al., 2003) En este trabajo hemos presentado una herramienta que permite evaluar su potencial restaurador. A pesar de haber sido desarrollada a tal fin, podría ser utilizada para estudiar también fenómenos psicológicos y sociales más allá de la propia restauración. En definitiva, si la calidad de los espacios urbanos es una medida de la calidad de vida urbana (Cattell et al., 2008), el *IEPREU* es una aproximación válida e interesante al estudio de la misma tanto desde la óptica académica como la aplica

ANEXO II

Inventario para la evaluación del potencial restaurador de espacios urbanos
(IEPREU)

IEPREU

Espacio evaluado: _____ Zona _____ Fecha: _____
 Evaluador/a: _____ Hora inicio: __ Hora fin: _____
 Meteorología: _____

1.	ACCESO AL ESPACIO	SÍ	NO															
1a.	¿El espacio está abierto al público durante todo el día? Si se ha escogido "NO" ¿Qué horario de apertura tiene? De _____ a _____ horas. Total horas apertura: _____	<input type="checkbox"/>	<input type="checkbox"/>															
1b.	¿Puede accederse al espacio libremente? Si se ha escogido "NO" ¿Qué procedimiento ha de seguirse para entrar? Especificar _____	<input type="checkbox"/>	<input type="checkbox"/>															
1c.	¿Hay elementos en las entradas que informan de la entrada en un espacio diferenciado? Si se ha escogido "SÍ", especifíquese cuáles: _____	<input type="checkbox"/>	<input type="checkbox"/>															
1d.	¿Cuál es el grado de dificultad de acceso y uso del espacio por parte de personas con problemas de movilidad? Nada- Poca-Bastante- Mucha Dificultad 0 1 2 3																	
1e.	¿Se puede acceder a la totalidad del mismo? Si se ha escogido "NO", especifíquese a qué partes no puede accederse y cuáles son las barreras que las restringen.	<input type="checkbox"/>	<input type="checkbox"/>															
	<table border="1"> <thead> <tr> <th>Ref.</th> <th>Partes sin acceso</th> <th>Barreras</th> </tr> </thead> <tbody> <tr> <td>1e1</td> <td></td> <td></td> </tr> <tr> <td>1e2</td> <td></td> <td></td> </tr> <tr> <td>1e3</td> <td></td> <td></td> </tr> <tr> <td>1e4</td> <td></td> <td></td> </tr> </tbody> </table>	Ref.	Partes sin acceso	Barreras	1e1			1e2			1e3			1e4				
Ref.	Partes sin acceso	Barreras																
1e1																		
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1e3																		
1e4																		

2.	PRESENCIA ELEMENTOS VEGETALES	NIVEL DE PRESENCIA/ DENSIDAD				DIVERSIDAD DE ESPECIES			POTENCIAL ESTÉTICO
	¿Se encuentran en el espacio previamente delimitado los siguientes elementos? Indíquense su nivel de presencia, la diversidad de especies que presentan y su grado de potencial estético.	Nulo	Bajo	Medio	Alto	1-3	4-6	7+	0-10
2a.	Árboles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
2b.	Sotobosque/seto	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
2c.	Flores	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
2d.	Maceteros o similar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
2e.	Hierba	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

ANEXO II

3. PAISAJE FÍSICO		NIVEL DE PRESENCIA				POTENCIAL ESTÉTICO/ PERTURBADOR		
		Nulo	Bajo	Medio	Alto	0-10		
3a.	Paisaje visual. Indíquese el nivel de presencia de los siguientes elementos y su grado de potencial estético o perturbador. 0= Ausencia de potencial estético/perturbador. 0= Ausencia de potencial estético/perturbador 1-10=Nivel de potencial estético/perturbador (Escríbase el potencial perturbador precedido de un signo menos (-)).							
	3a1	¿Se percibe visualmente tejido urbano?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	
	3a2	¿Se percibe visualmente paisaje vegetal?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	
	3a3	¿Se percibe visualmente paisaje marino?						
		3a3a	Mar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
		3a3b	Playa	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
		3a3c	Isla/s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	3a4	¿Se perciben visualmente masas de agua?						
		3a4a	Lago/estanque o similar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
		3a4b	Río, arroyo o similar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	3a5	¿Se perciben visualmente montañas, colinas o elementos similares?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	
	3b	Paisaje sonoro. Indíquese el nivel de presencia de los siguientes elementos y su grado de potencial estético o perturbador .						
		3b1	¿Se escuchan cantos de pájaros?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
3b2		¿Se escuchan otros animales?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	
3b3		¿Se escuchan sonidos marinos?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	
3b4		¿Se escuchan fuentes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	
3b5		¿Se escuchan ruidos procedentes de la actividad urbana cotidiana (coches, motos, obras...)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	
3b6		¿Se escuchan otros sonidos que deban tenerse en cuenta?						
		3b6a	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
		3b6b	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	3b6c	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	

3c	Paisaje olfativo. Indíquese el nivel de presencia de los siguientes elementos y su grado de potencial estético o perturbador .						
	3c1	¿Se aprecian olores vegetales (plantas, flores, árboles)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	3c2	¿Se aprecian olores marinos?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	3c3	¿Se aprecian olores procedentes de la actividad urbana cotidiana (humos de automóviles, fábricas...)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	3c4	¿Se aprecian otros olores que deban tenerse en cuenta?					
	3c4a	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
3c4b	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	

4.	PRESENCIA ELEMENTOS CONSTRUIDOS	SÍ	NO	POTENCIAL ESTÉTICO
	¿Se encuentran en el espacio previamente delimitado los siguientes elementos? Si se ha escogido "SÍ", especifíquese a continuación su grado de potencial estético. <i>0= Ausencia de potencial estético.</i> <i>1-10=Nivel de potencial estético</i>			0-10
4a.	Residencial	<input type="checkbox"/>	<input type="checkbox"/>	_____
4b.	Oficinas o centros de trabajo	<input type="checkbox"/>	<input type="checkbox"/>	_____
4c.	Centros comunitarios (especifíquese _____)	<input type="checkbox"/>	<input type="checkbox"/>	_____
4d.	Museo o similar	<input type="checkbox"/>	<input type="checkbox"/>	_____
4e.	Zonas recreativas	<input type="checkbox"/>	<input type="checkbox"/>	_____
4f.	Infraestructuras para deporte	<input type="checkbox"/>	<input type="checkbox"/>	_____
4g.	Uso agrario, pecuario o ganadero	<input type="checkbox"/>	<input type="checkbox"/>	_____
4h.	Bares y restaurantes	<input type="checkbox"/>	<input type="checkbox"/>	_____
4i.	Comercios	<input type="checkbox"/>	<input type="checkbox"/>	_____
4j.	Edificios, construcciones o lugares que contribuyan a la Imaginabilidad y/o personalidad del espacio. Si se ha escogido "SÍ", refiérase el edificio, construcción o lugar y especifíquese su grado de potencial estético. <i>Acuérdense con el resto de jueces.</i>	<input type="checkbox"/>	<input type="checkbox"/>	
4i1				_____
4i2				_____
4i3				_____
4i4				_____

ANEXO II

	4i5				_____
4k.	Elementos de arte urbano Si se ha escogido “ SÍ ”, refiérase el elemento de arte urbano y especifíquese su grado de potencial estético. <i>Acuérdense con el resto de jueces.</i>	<input type="checkbox"/>	<input type="checkbox"/>		
	4j1				_____
	4j2				_____
	4j3				_____
	4j4				_____
	4j5				_____

5. DIVERSIDAD ARQUITECTÓNICA					
A la hora de cumplimentar este apartado, inclúyanse los edificios visibles desde el espacio evaluado.					
5a	¿Hay elementos decorativos o de diseño en las fachadas y tejados? Inclúyase aquí todo lo que se salga de la austeridad más absoluta.	Nivel de presencia			
		Nulo (0)	Bajo (1)	Medio (2)	Alto (3)
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Indique el grado de diversidad presente en los edificios del espacio para las siguientes categorías	Nivel de diversidad			
		Nulo (0)	Bajo (1)	Medio (2)	Alto (3)
5b	Diversidad cromática Indíquese el nivel de diversidad cromática presente en los edificios del espacio.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5c	Diversidad de alturas. Indíquese el nivel de diversidad de alturas que presentan los edificios del espacio.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5d	Diversidad de diseño. Indíquese el nivel de diversidad de diseños que presentan los edificios del espacio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5e	Diversidad de materiales. Indíquese el nivel de diversidad de materiales que presentan los edificios del espacio.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. EQUIPAMIENTO		SÍ	NO	Suficiente	
	¿Está equipado el espacio con el siguiente mobiliario urbano? Si se ha escogido "SÍ", especifíquese si la cantidad de cada elemento es suficiente para la utilización satisfactoria del espacio.			SÍ	NO
6a	Bancos.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6b	Aparca-bicis.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6c	Farolas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6d	Fuentes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6e	Papeleras.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. SENDAS		SÍ	NO / No se sabe										
7a	7a1	¿Las sendas que recorren el lugar están completas?	<input type="checkbox"/>										
	7a2	Si se ha escogido "NO", ¿puede caminar de forma segura y cómoda por otro sitio?	<input type="checkbox"/>										
	7a3	¿Hay bidegorri?	<input type="checkbox"/>										
	7a4	Si se ha escogido "NO" en el ítem anterior, ¿se permite el uso de bicicleta (atención a señales prohibición)?	<input type="checkbox"/>	<input type="checkbox"/> / <input type="checkbox"/>									
	7a5	Independientemente de los ítems anteriores, ¿hay ciclistas usando las sendas?	<input type="checkbox"/>	<input type="checkbox"/>									
7b	7b1	¿Las sendas presentan obstrucciones?	<input type="checkbox"/>										
	7b2	Si se ha escogido "SÍ", indíquese la naturaleza de las obstrucciones. Seleccionar todas las modalidades presentes.	<table border="1"> <thead> <tr> <th colspan="2">Naturaleza de las obstrucciones</th> </tr> </thead> <tbody> <tr> <td>7b2a Naturales (árboles, rocas...)</td> <td><input type="checkbox"/></td> </tr> <tr> <td>7b2b Artificiales (basura, obras...)</td> <td><input type="checkbox"/></td> </tr> <tr> <td>7b2c Temporales</td> <td><input type="checkbox"/></td> </tr> <tr> <td>7b2d Permanentes</td> <td><input type="checkbox"/></td> </tr> </tbody> </table>		Naturaleza de las obstrucciones		7b2a Naturales (árboles, rocas...)	<input type="checkbox"/>	7b2b Artificiales (basura, obras...)	<input type="checkbox"/>	7b2c Temporales	<input type="checkbox"/>	7b2d Permanentes
Naturaleza de las obstrucciones													
7b2a Naturales (árboles, rocas...)	<input type="checkbox"/>												
7b2b Artificiales (basura, obras...)	<input type="checkbox"/>												
7b2c Temporales	<input type="checkbox"/>												
7b2d Permanentes	<input type="checkbox"/>												
7c	Llano- Ligera-Moderada- Mucha Grado de inclinación de las sendas. 0 1 2 3												

ANEXO II

8. DESORDEN FÍSICO		NIVEL DE PRESENCIA			
8a	Desorden físico. ¿Se perciben los siguientes elementos?	Nulo	Bajo	Medio	Alto
8a1	Basura tirada por el suelo.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8a2	Grafitis.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8a3	Objetos abandonados.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8a4	Otros (especificar) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8a5	Otros (especificar) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8b	Nivel de mantenimiento ¿Está el espacio limpio y bien mantenido? (0= Sin mantenimiento, 1=Poco mantenido, 2=Medianamente mantenido, 3= Bien mantenido, 4=Muy bien mantenido).	Nivel de mantenimiento			
		0	1	2	3
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8b1	Vegetación (árboles, hierba, flores)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8b2	Elementos construidos.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8b3	Mobiliario urbano.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8b4	Sendas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. SEGURIDAD		SÍ	NO	NÚMERO
9a	Seguridad objetiva ¿Hay en el espacio...? Si se ha escogido "SÍ", especifíquese el número de elementos de cada categoría.	<input type="checkbox"/>	<input type="checkbox"/>	_____
9a1	Policías o guardas de seguridad.	<input type="checkbox"/>	<input type="checkbox"/>	_____
9a2	Cámaras de videovigilancia. ¿A quién están enfocadas? Propiedad privada/pública Personas usuarias	<input type="checkbox"/>	<input type="checkbox"/>	_____
9a3	Señales de atención ante determinados peligros. Si se ha escogido "SÍ", especifíquese los peligros sobre los que advierten.	<input type="checkbox"/>	<input type="checkbox"/>	_____
9a3a	_____			
9a3b	_____			
9a3c	_____			
9a4	Otros elementos de seguridad objetiva. Si se ha escogido "SÍ", especifíquese los mismos.	<input type="checkbox"/>	<input type="checkbox"/>	_____
9a4a	_____			
9a4b	_____			
9a4c	_____			

9. SEGURIDAD (cont.)								
9b	Seguridad subjetiva Dentro del espacio...		Frecuencia de observación por parte de otros/as					
	9b1	¿Con qué frecuencia puede una persona usuaria ser vista por otras personas presentes en las inmediaciones? <i>(0= Nunca, 1=Casi nunca, 2=A veces, 3= A menudo, 4= Casi siempre y 5=Siempre).</i>	0	1	2	3	4	5
9b2	Enclosure.		Frecuencia en la que la persona usuaria... <i>(utilídense los niveles anteriores)</i>					
	9b2a	La persona usuaria puede anticipar visualmente cualquier contingencia que pudiera entrañar peligro o rechazo.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	9b2b	Ante cualquier contingencia que entrañase peligro o rechazo, la persona usuaria puede alejarse de ella en varias direcciones.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9b3	¿Puede la persona usuaria ser víctima de...? Si se ha escogido "Sí", especifíquese el grado de inseguridad percibido para dicho peligro. <i>(1= Muy bajo, 2=Bajo, 3=Medio, 4= Alto, 5=Muy alto)</i>		SÍ	NO	Nivel de riesgo (en relación a la media general en contextos urbanos)			
					<	=	>	
	9b3a	Ser víctima de un atropello por parte de un coche	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	9b3b	Ser un víctima de un atropello por parte de una bicicleta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	9b3c	Caerse al suelo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	9b3d	Otro _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	9b3e	Otro _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9b3f	Otro _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

ANEXO II

10. INDICADORES PSICOAMBIENTALES		Facilidad para encontrar y seguir las sendas						
10a	Orientación	Muy difícil (0)	Difícil (1)	Ni difícil ni fácil (2)	Fácil (3)	Muy fácil (4)		
	10a1	Seguir las sendas y llegar al destino es...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	10a2	¿Hay elementos (señales, mapas, cuadros de interpretación, letreros...) que facilitan la orientación? Si se ha escogido "Sí", especifíquese la tipología de los elementos presentes.	SÍ <input type="checkbox"/>	NO <input type="checkbox"/>	¿Qué elementos? 10a2a _____ 10a2b _____ 10a2c _____ 10a2d _____ 10a2e _____			
10b	Coherencia Expresa su grado de acuerdo con las siguientes afirmaciones. (0= Totalmente en desacuerdo, 1=Bastante en desacuerdo, 2=Algo en desacuerdo, 3= Algo de acuerdo, 4= Bastante de acuerdo y 5=Muy de acuerdo).	Organización del espacio						
		0	1	2	3	4	5	
	10b1	El espacio está organizado de forma coherente	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10b2	Los elementos encajan de forma natural unos con otros	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10b3	Hay un orden claro en la disposición del lugar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10b4	¿Hay elementos que rompen la armonía del lugar? Si se ha escogido "Sí", especifíquense los elementos y el grado de discordancia percibida. (1= Muy poco discordante, 2=Poco discordante, 3=Algo discordante, 4=Discordante, 5=Bastante discordante, 6= Muy discordante).	Grado de discordancia percibida						
		1	2	3	4	5	6	
	10b4a	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10b4b	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10b4c	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

10. INDICADORES PSICOAMBIENTALES (cont.)								
10c	Imaginabilidad ¿Hasta qué punto considera que... (0= Muy difícil, 1=Bastante difícil, 2=Algo difícil, 3= Algo fácil, 4= Bastante fácil y 5=Muy fácil).		0	1	2	3	4	5
	10c1	...es fácil descodificar las características y funciones sociales del espacio?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10c2	...es fácil entender la estructura del espacio?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10c3	...es fácil que el espacio suscite una impresión vivida en la persona usuaria?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Expresar hasta qué punto el espacio presenta las siguientes características (0= Nada, 1=Casi nada, 2=Poco, 3= Algo, 4=Bastante, 5= Mucho).		Grado de presencia de las siguientes características					
			0	1	2	3	4	5
10d	Penetración/alcance visual. Pueden verse partes del espacio más allá del punto en el que uno/a se encuentra.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10e	Misterio. Partes o zonas del espacio inmediatamente posteriores a las actualmente observadas no son estrictamente evidentes y se vislumbran o intuyen tras coberturas naturales o construidas.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10f	Singularidad. El espacio es distinto a su entorno urbano inmediato.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10g	Identidad. El espacio goza de una identidad propia dentro del conjunto urbano (o ciudad).		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10h	Unicidad. El espacio es único en el conjunto urbano (o ciudad).		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10i	Susceptibilidad de ser explorado.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10i1	El lugar puede ser explorado en varias direcciones.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10i2	El lugar invita a ser explorado.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10i3	El lugar puede explorarse más allá de las sendas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10j	Quietud y tranquilidad El espacio es tranquilo y presenta una atmósfera relajada.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ANEXO II

11. PAISAJE SOCIAL							
11a.	¿Se ven personas en el espacio haciendo las siguientes actividades? Si se ha escogido "Sí", especifíquese su nivel de presencia (número aproximado) y las actividades que realizan.	Nulo (0)	Bajo (1-10)	Medio-Bajo (11-20)	Medio (20-30)	Medio-Alto (30-40)	Alto (40+)
11a1	Pasear o desplazarse.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11a2	Charlar.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11a3	Hacer deporte (correr, bici, deportes de equipo...).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11a4	Leer o similar (especifíquese _____).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11a5	Contemplar el lugar o el paisaje	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11a6	Acompañar a niños/as u otras personas dependientes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11a7	Pasear al perro	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11a8	Trabajar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11a9	Otras actividades. Si se ha escogido "Sí", especifíquese las mismas y su nivel de presencia (número aproximado).						
11a9a	_____		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11a9b	_____		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11a9c	_____		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. PAISAJE SOCIAL (cont.)									
11b	Diversidad étnica Indíquese el nivel de presencia de los siguientes colectivos étnicos en relación al total de personas presentes en el espacio.	Grado de presencia de colectivos étnicos							
			Nulo	Bajo	Medio	Alto			
		Caucásico	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		Negro	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		Asiático	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		Americano (no caucásico)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	Gitano	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
11c	Diversidad de sexos Indíquese el nivel de presencia de cada sexo en relación al total de personas presentes en el espacio.	Grado presencia sexos							
		Mujer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		Hombre	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
11d	Diversidad de edades Indíquese el nivel de presencia de cada grupo de edad en relación al total de personas presentes en el espacio.	Grado presencia edades							
		Niños/as	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		Adolescentes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		Adultos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		Mayores	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
11e	Paisaje social Expresa hasta qué punto el paisaje social presenta las siguientes características teniendo en cuenta las actividades, colectivos étnicos, grupos de edad y sexo de las personas usuarias (0= Nada, 1=Casi nada, 2=Poco, 3= Algo, 4=Bastante, 5= Mucho).	Grado de presencia de las siguientes características							
			0	1	2	3	4	5	
		11e1	El paisaje social es compatible con la experiencia de restauración	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		11e2	El paisaje social puede generar interés, disfrute y/o fascinación.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		11e3	El paisaje social es diverso.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ANEXO II

12. DESORDEN SOCIAL					
12a	Desorden social. ¿Se percibe a personas...? Si se ha escogido "SÍ", especifíquese el número de personas realizando cada conducta.				
		SÍ	NO	Nº personas	Potencial Perturbador 0-10
12a1	Gritando y discutiendo.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
12a2	Peleando.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
12a3	Consumiendo alcohol u otras drogas	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
12a4	Transeúntes	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
12a5	Personas con deterioro físico/social significativo	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
12a6	Realizando actividades ilícitas o que pudieran despertar recelo o rechazo en otros ciudadanos Si se ha escogido "SÍ", especifíquese la/s actividad/es	<input type="checkbox"/>	<input type="checkbox"/>		
	12a6a	_____		_____	_____
	12a6b	_____		_____	_____
	12a6c	_____		_____	_____

La restauración psicológica es un proceso que permite recuperarse de la fatiga atencional y el cansancio emocional derivados del desempeño cotidiano al entrar en contacto con espacios que poseen determinadas cualidades. Durante décadas, la Psicología Ambiental ha prestado poca atención a espacios urbanos construidos debido a la asunción general de que éstos tienen un menor potencial restaurador que los espacios naturales o naturalizados (p.ej. parques, bosques o lagos). Incluso, se ha entendido que los primeros podrían ser los causantes de los estados de fatiga cognitiva y emocional de los que luego habría que recuperarse. Hoy que más de la mitad de la población mundial vive en entornos urbanos, el proceso de cambio climático es patente y asistimos al agotamiento de combustibles fósiles, se hace necesario volver la mirada a estos escenarios y repensarlos para aumentar su potencial restaurador. Esta tesis compila una revisión sistemática (capítulo 1), cuatro estudios experimentales (capítulos 2, 3, 4 y 6) y dos estudios de encuesta (capítulos 5 y 7). En su conjunto, han revelado que el uso de espacios urbanos construidos, en este caso plazas, puede otorgar experiencias de restauración en términos cognitivos y afectivos y por tanto invitan a continuar con esta línea de investigación. Asimismo, este trabajo ha permitido valorar el papel del apego y la identificación con el espacio en la obtención de beneficios restauradores y adelantar algunos de los interrogantes que la investigación en esta área habrá de afrontar en el futuro.