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Tesis Doctoral

Situational and Opportunity Factors Associated with Juvenile Delinquency

Los Factores Situacionales y de Oportunidad Asociados a la Delincuencia Juvenil

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1.
Introducción

El manuscrito que a continuación se presenta es una tesis doctoral que, siguiendo un formato por "compendio de contribuciones", reúne el trabajo realizado a lo largo de cuatro años. La tesis está compuesta por un capítulo introductorio (capítulo 1), 6 estudios (capítulos 2, 3, 4, 5, 6 y 7) y un capítulo final de conclusiones (capítulo 8). En cuanto a las contribuciones realizadas, algunas de ellas se encuentran ya publicadas en revistas científicas, otras en proceso de revisión y otras pendientes de ser enviadas (ver Anexo I). De los estudios cabe destacar que reflejan el desarrollo de un proceso de aprendizaje de diferentes métodos y estrategias a lo largo de todo este tiempo.

1.1. La Delincuencia Juvenil

1.1.1. Conceptualización

La delincuencia juvenil es un fenómeno que entraña tal complejidad que incluso la búsqueda de un concepto común para referirse al mismo parece ser una tarea difícil de llevar a cabo. De este modo, en la literatura anglosajona podemos encontrar diferentes términos para referirnos a este fenómeno y otros que incluso engloban conductas que, aun siendo legales, se encontrarían fuera de la

norma social: *youth crime, juvenile delinquency, adolescence delinquency, juvenile antisocial behaviour,* o *juvenile offending*. De manera similar, aunque con un abanico más reducido, la literatura en castellano recoge varios términos para referirse al mencionado fenómeno: *delincuencia juvenil, criminalidad juvenil, comportamiento antisocial juvenil* o *infracciones juveniles.* Cabe decir, sin embargo, que el uso de algunos de estos términos ha sido rechazado por varios autores que hablan de evitar la estigmatización de las personas menores de edad, y por ello se ha preferido utilizar, sobre todo en el ámbito del derecho penal, los términos *infracciones* y *personas infractoras*, en vez de *delincuencia juvenil* u otras terminologías con connotaciones más negativas (Beristain, 1989; Vázquez, 2007). Si bien es cierto, y a pesar de lo anterior, que la influencia anglosajona ha hecho que en los países de habla hispana, por lo general, adoptemos el término de *delincuencia juvenil* (Aebi, 2017).

En este punto, convendría definir a qué se refiere la literatura científica con el término *juvenil,* ya que el mismo podría comprehender un rango bastante amplio de edades. Tal y como Aebi (2017) menciona, el vocablo *juvenil* proviene de *juventud,* que se identifica con la fase intermedia que se encuentra entre la infancia y la edad adulta. Debido a la influencia de la ya mencionada literatura académica en inglés, en la literatura en castellano se utiliza, en la mayoría de los casos, el término juvenil para hacer referencia a personas adolescentes (Aebi, 2017), y más concretamente en el panorama español, a personas entre los 14 y 18 años, debido a que ese es el rango de edad en la que las personas menores de edad son juzgadas por la ley de responsabilidad penal del menor (L.O. 5/2000[1]). Sin embargo, debemos de tener en cuenta que la edad mínima de responsabilidad penal puede variar dependiendo del estado europeo en el que nos encontremos, incluso abarcando edades previas a la adolescencia. Así, la edad mínima de responsabilidad penal en el panorama europeo oscila

[1] Ley Orgánica 5/2000, de 12 de enero, reguladora de la responsabilidad penal de los menores https://www.boe.es/buscar/act.php?id=BOE-A-2000-641

entre los 10 años y los 16 años (European Agency for Fundametal Rights, 2018). Por todo ello, en el presente trabajo se ha de tener en cuenta que cuando se haga mención a *delincuencia juvenil*, *infracciones juveniles* o *comportamiento antisocial juvenil*, se estará hablando de conductas realizadas por personas comprendidas entre los 12 y los 18 años que vayan contra la normativa vigente. Dado que en Europa la edad mínima –como antes se mencionaba- es de 10 a 16 años y los datos policiales de nuestra muestra son a partir de los 12 años, se ha asumido esta edad mínima para el presente estudio.

1.1.2. Factores de riesgo y protección

La delincuencia juvenil, como toda casuística social, es un fenómeno que inevitablemente tiene un componente multiaxial. En este sentido, estudios longitudinales prospectivos como los llevados a cabo en Londres y Pittsburgh han sido esenciales para la búsqueda e identificación de una serie de factores de riesgo –entendiéndose éstos como elementos que incrementan la probabilidad de que se dé un comportamiento delictivo (Murray & Farrington, 2010)- y de protección –siendo aquellas características que ayudan a reducir la probabilidad de que el fenómeno delictivo ocurra (Farrington & Ttofi, 2012)- que se han mantenido estables en diferentes contextos (Farrington, 2002). Así, a grandes rasgos se podría decir que los factores o dimensiones se agrupan en tres diferentes niveles (Redondo, 2008): *individual/personal*, *social* y *contextual/situacional.*

1.1.2.1. Personal/ individual

En este nivel se estudiarían todas las características individuales de las personas jóvenes infractoras, tales cómo, *edad, rasgos de personalidad* o *psicológicos*. Así, la literatura científica a nivel internacional ha mostrado mediante estudios longitudinales que la *edad* es uno de los elementos más estables para explicar la delincuencia (Moffitt, 1993). En particular, la evidencia empírica se ha mostrado contundente al asegurar que el pico más alto de implicación en la

delincuencia se da aproximadamente entre los 15-17 años de edad y que desciende a medida que las personas se adentran en la adultez –ver Figura 1.1- (DeLisi, 2015).

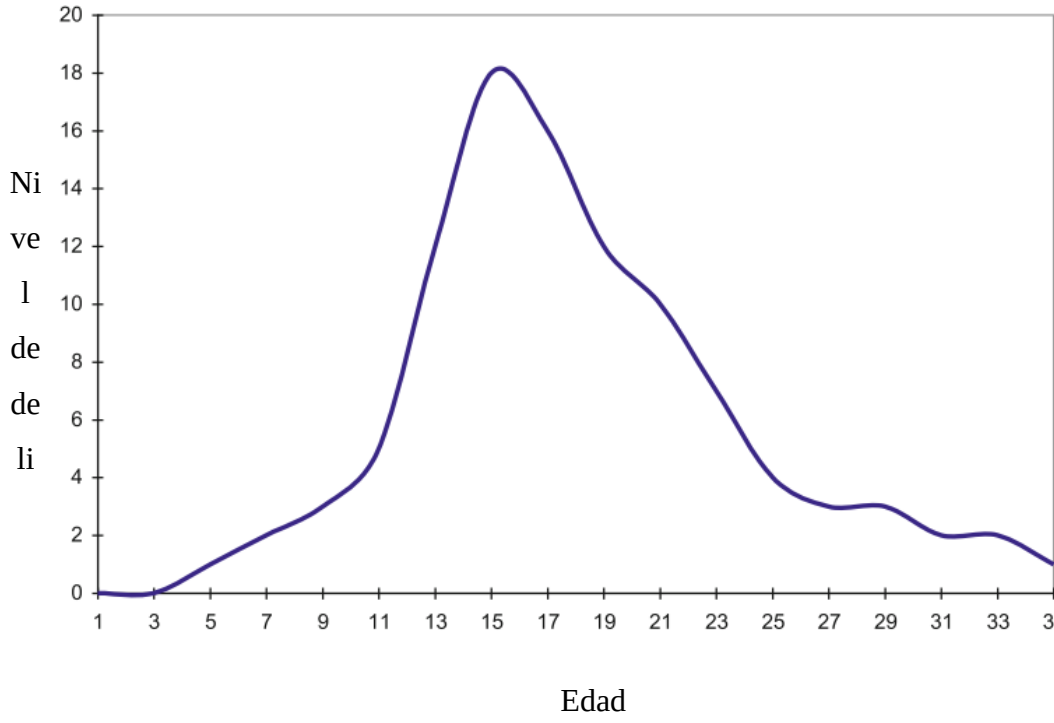


Figura 1.1. Curva edad y crimen. Fuente: (DeLisi, 2015).

En este sentido, es necesario mencionar que, según la denominada *taxonomía dual de Moffitt* (Moffitt, 1993), existirían dos grupos en los que se podría categorizar a las personas infractoras en base a la edad de inicio de las conductas antisociales: *persistentes* y *limitados a la adolescencia*. Aunque diversos autores también reconocerán la existencia de un tercer grupo no tan estudiado: el de *comienzo tardío* (Kratzer & Hodgins, 1999). Según esta perspectiva, las personas con un comportamiento antisocial previo a la adolescencia –grupo de *persistentes*- continuarían con el mismo en la etapa adulta y se caracterizarán por cometer los delitos más graves y tener una trayectoria delictiva crónica (Eggleston & Bacon, 2019). En lo que al grupo

limitado a la adolescencia se refiere, estos empezarían su actividad delictiva al inicio de la adolescencia –a los 12-15 años- y cesaría una vez se adentran en la edad adulta. Respecto a este grupo, la literatura refiere que su conducta antisocial se debe a la etapa de conflicto que se da durante la adolescencia. En último lugar, el grupo de *comienzo tardío* lo compondrían aquellas personas que comienzan su carrera delictiva una vez pasada la etapa adolescente, a partir de los 18 años (Eggleston & Laub, 2002).

Una de las cuestiones que se plantea es, que si se tiene la certeza de que el comportamiento antisocial es fruto de la falta de madurez propia de la adolescencia, la mejor intervención sería la "no-intervención", suponiendo que este comportamiento decrecería con el paso del tiempo (San Juan & Vozmediano, 2018). Sin embargo, no sería apropiado un enfoque tan reduccionista para un problema que ya hemos mencionado que es complejo, ya que existen otras variables que tienen un peso relevante en la etiología del comportamiento delictivo. En este sentido, estudios longitudinales han señalado que en el grupo de persistentes el factor genético influye más en la etiología que en los limitados a la adolescencia. Además, en el caso de los persistentes, los factores de riesgo estarían asociados a problemas de neurodesarrollo y adversidades familiares, cosa que no ocurre en el grupo de limitados a la adolescencia. El grupo de persistentes también se ha asociado a conductas delictivas más serias y violentas. Por último, en cuanto al género, se ha observado que en el grupo de persistentes la mayoría son chicos, mientras que en el caso del comportamiento antisocial de las chicas se asocia con el grupo limitado a la adolescencia (Piquero & Moffitt, 2014).

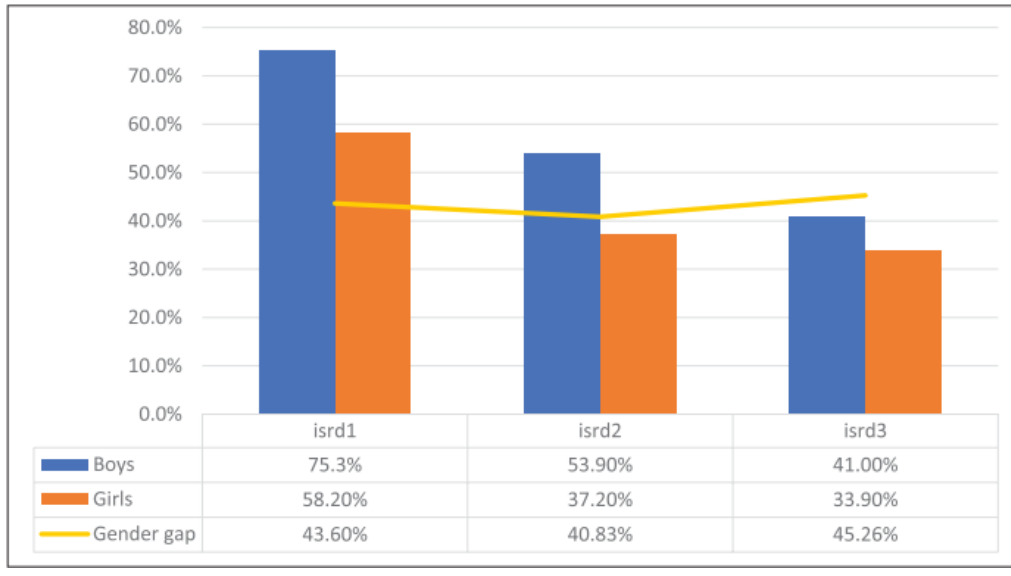
En cuanto a los *rasgos de personalidad* y *características psicológicas* se refiere, la evidencia se ha mostrado concluyente en ciertas variables y su asociación con la delincuencia. Así, en la revisión de Morizot (2015) la autora señala que los estudios son claros respecto a la asociación de ciertas

características de personalidad y conductas delictivas. Por ejemplo, la impulsividad, la inatención, la irritabilidad, la agresividad o la dureza emocional se han relacionado con comportamientos antisociales y delictivos tanto en la adolescencia como en la adultez.

En este contexto, cabría mencionar el planteamiento que propone Wikström en su teoría integradora, la Teoría de la Acción Situacional (Wikström, 2004, 2006). Plantea la importancia directa e indirecta que tiene la *propensión al delito* de las personas a la hora de explicar comportamiento antisocial y delictivo. Sin llegar a haber un consenso por parte de la comunidad científica para operacionalizar la *propensión al delito*, ésta se ha medido, a menudo, utilizando escalas de autocontrol e instrumentos para medir los valores morales (Pauwels, Svensson, & Hirtenlehner, 2018). Así, las personas con una alta propensión al delito –es decir, con un bajo autocontrol y puntuaciones bajas en valores morales- tendrían una mayor probabilidad de verse involucrados en algún tipo de actividad delictiva (Bruinsma, Pauwels, Weerman, & Bernasco, 2015). De la misma manera, se ha comprobado que las personas adolescentes con una alta *propensión al delito* pasan mayor tiempo en lugares criminogénicos –entornos que por sus características aumentan la probabilidad de que ocurra un delito.

No nos podemos olvidar de una variable individual que es esencial para predecir el comportamiento delictivo: el *género.* Esta es, sin duda, una de las variables estáticas con una gran influencia sobre la delincuencia. En particular, los datos –tanto oficiales como los de auto-informe- muestran que los chicos cometen muchas más infracciones que las chicas –ver Figura 1.2- (Fernández-Molina & Bartolomé Gutiérrez, 2018). La literatura científica ha encontrado diferentes elementos que afectan más a un sexo que al otro (Steketee, Junger, & Junger-Tas, 2013; Weerman, Bernasco, Bruinsma, & Pauwels, 2016). Por

ejemplo, se ha observado que las chicas presentan mayores puntuaciones de auto-control y valores morales (Weerman et al., 2016).



	isrd1	isrd2	isrd3
Boys	75.3%	53.90%	41.00%
Girls	58.20%	37.20%	33.90%
Gender gap	43.60%	40.83%	45.26%

Figura 1.2. Datos de auto-informes de infracciones juveniles por sexo. Fuente: (Fernández-Molina & Bartolomé Gutiérrez, 2018).

En resumen, teniendo en cuenta las características individuales, se podría decir que los chicos de entre 15 y 17 años, con un bajo auto-control y una baja moralidad, se ajustarían al perfil de menores infractores.

1.1.2.2. Social

La literatura científica ha mostrado, en este nivel, que los diferentes entornos sociales como la *familia*, los *pares*, la *escuela* y el *barrio* son esenciales a la hora de explicar la delincuencia juvenil. Así, diferentes estudios han mostrado que las relaciones parentales pueden tener influencia directa e indirecta sobre el comportamiento antisocial y delictivo (Janssen, Eichelsheim, Dekovic, & Bruinsma, 2016). Particularmente, la evidencia ha encontrado que el estilo parental tiene una relación directa con la delincuencia juvenil, pero que cuando se introducen múltiples relaciones, por ejemplo, con el auto-control o las actitudes hacia la delincuencia, la asociación entre estilo parental y delincuencia

juvenil muestra estar mediada (Janssen et al., 2016). Además, se ha podido observar cómo el estilo de crianza parental está asociado a características de la personalidad de los jóvenes[2] como la dureza emocional o el auto-control, que están directamente relacionadas con conductas antisociales, como previamente se ha comentado (Janssen et al., 2016; López-Romero, Romero, & Gómez-Fraguela, 2015). Por otro lado, el estilo parental puede hacer que los progenitores estén más o menos pendientes de sus descendientes y, como veremos más adelante, este control ha mostrado relaciones negativas con el tiempo que las personas menores pasan en escenarios criminogénicos (Janssen, Bruinsma, Deković, & Eichelsheim, 2018).

Durante la adolescencia, el grupo de *pares* es esencial para la conformación de la identidad de los chicos y las chicas. En este sentido, la influencia del grupo de pares puede facilitar involucrarse en escenarios de conducta de riesgo (Hoeben & Weerman, 2016). Múltiples investigaciones han mostrado que el tiempo que los menores pasan con sus pares de una manera desestructurada aumenta la probabilidad de que participen en conductas antisociales. El mero hecho de pasar tiempo haciendo "nada" en compañía de otros supone un riesgo en sí mismo. De la misma manera, existe evidencia de que la participación en actividades estructuradas con pares también podría conducir a comportamientos disruptivos, por ejemplo, el consumo de tóxicos. Sin ir más lejos, existe literatura que asocia la práctica deportiva organizada con conductas antisociales y delictivas de los jóvenes (Gardner, Roth, & Brooks-Gunn, 2009; Lane & DeCamp, 2017).

La *educación* formal también ha sido considerada como un elemento necesario a la hora de entender la delincuencia juvenil. Hay que tener en cuenta que las personas menores pasan una gran parte de su tiempo socializando en los

[2] En este trabajo cuando se hable de los jóvenes o menores, nos estaremos refiriendo a los y las jóvenes o/y menores.

centros de estudios. Muchos de los estudios longitudinales han apuntado la relación positiva entre fracaso escolar y delincuencia juvenil (Murray & Farrington, 2010). Siendo esto cierto, como bien apunta Aebi (2017) en este tema, la dirección de esta asociación distaría de establecer una causalidad contundente al respecto. Por lo que no se puede concluir que todo fracaso escolar conlleve una participación en conductas antisociales, o que éste sea el resultado de una conducta disruptiva.

Para finalizar este apartado, es necesario mencionar la relevancia que tiene el *barrio* y el contexto socio-económico donde las personas menores de edad se socializan y/o dónde ocurre la delincuencia juvenil. El desarrollo económico y urbanístico hace que hoy en día existan factores que difieren de los propuestos por las teorías clásicas que trataban de dar una explicación a la delincuencia en otra época (Medina, 2010) –ver Escuela de Chicago (Shaw & McKay, 1942). En este sentido, y centrándonos más en lo que puede implicar un déficit del capital social o el control social (Medina, 2010), variables tales como las desventajas sociales, concentración de la inmigración e inestabilidad residencial (Sampson, Raudenbush, & Earls, 1997) se consideran hoy en día como predictivas a la hora de estudiar la delincuencia juvenil (Browning, Soller, & Jackson, 2015; Wikström & Treiber, 2016). Aunque la investigación realizada en Europa en las últimas décadas ha mostrado que las variables de la oportunidad explican mejor la delincuencia que las variables socio-económicas (Pauwels, Bruinsma, Weerman, Wim, & Bernasco, 2018), la evidencia empírica en el contexto europeo sí que ha mostrado una influencia de las variables socio-económicas sobre el delito de manera indirecta. Así, el desarrollo infantil en un escenario de desventajas sociales estaría asociado positivamente con la propensión al delito y con el tiempo que los chicos y las chicas pasan en espacios criminogénicos (Wikström & Loeber, 2000; Wikström & Treiber, 2016).

1.1.2.3. Contextual/situacional

Aunque este nivel será convenientemente desarrollado en el capítulo 2, cabe adelantar en este apartado que, desde las perspectivas de la oportunidad se ha postulado la importancia de los escenarios de conducta en la etiología del comportamiento antisocial. A diferencia del resto de perspectivas anteriormente mencionadas, en ésta el objeto de interés será el evento delictivo o el espacio donde el mismo ocurre (Wortley & Townsley, 2017). En este sentido, la investigación empírica ha observado que la socialización de manera desestructurada en lugares públicos o semipúblicos se asocia más con la delincuencia juvenil que la socialización en lugares privados (Hoeben & Weerman, 2014). La evidencia también apunta a que los lugares donde los menores pasan la mayor parte de su tiempo de ocio son los escogidos por estos para cometer infracciones (Bichler, Malm, & Enriquez, 2014). Del mismo modo, espacios comerciales y con restaurantes también han mostrado una correlación positiva con la delincuencia juvenil (Bernasco, 2019). Los espacios con instalaciones donde, en principio, se deberían llevar a cabo actividades que promueven valores prosociales, como pueden ser colegios, bibliotecas, polideportivos o centros culturales, están relacionados con las infracciones cometidas por adolescentes (Bichler et al., 2014; Johnson & Summers, 2015).

Al igual que ocurre con los delitos cometidos por personas adultas, los lugares en los que ocurren las infracciones de los menores de edad no se distribuyen al azar en las ciudades. En un estudio longitudinal de las infracciones cometidas por personas entre 8 y 17 años (Weisburd, Morris, & Groff, 2009) se encontró que el 50% tuvieron lugar en menos del 5% de los segmentos de calle, mostrando una clara concentración en el espacio. De manera similar, más recientemente Bernasco (2019) encontraba que una de las variables que mejor predecía la elección de un lugar para delinquir era el lugar donde los menores habían cometido previamente algún delito. Por tanto, como se puede observar, las infracciones que cometen las personas menores de edad siguen un

patrón espacial, que se ha corroborado tanto en ciudades norteamericanas como del norte de Europa.

Resumiendo, en los apartados precedentes se ha podido ver cómo ciertos factores a distintos niveles incrementarían la probabilidad de que las personas jóvenes perpetren un delito. Sin embargo, la literatura también ha mostrado que muchos de los factores de riesgo son en realidad dimensiones (Redondo, 2008, 2015), en las que un extremo -por ejemplo, control parental negligente- constituye un factor de riesgo, pero en el extremo opuesto -control parental adecuado, en este ejemplo- encontramos el factor protector correspondiente. En definitiva, como se puede observar, el fenómeno de la delincuencia juvenil, no deja de ser un puzle con muchas piezas, que aun agrupándolas por diferentes niveles –*individual*, *social* y *contextual*- no dejan de estar interconectadas entre sí, siendo extremadamente tenue la línea que separa los niveles, pudiendo llegar a interpretarse como uno u otro dependiendo de la conceptualización teórica que se haga. Un ejemplo de esto sería la socialización con pares con conductas de riesgo, que bien podría interpretarse como un elemento social, aunque ciertos autores sostienen que la mera presencia de éstos podría constituir un precipitador ambiental para cometer delitos violentos (Hoeben & Weerman, 2016).

1.2. Motivaciones, objetivos y estructura

1.2.1. Motivaciones

Como se ha descrito en el apartado referido a los factores de riesgo, la delincuencia juvenil es un fenómeno que necesariamente debe ser estudiado desde diversas perspectivas y teniendo en cuenta diferentes niveles de análisis. De esta manera, la literatura científica ha mostrado cómo los factores individuales y sociales de la delincuencia juvenil han sido aquellos que más se han investigado (Medina, 2011b), pero bien es cierto que los factores

situacionales han asumido un mayor protagonismo en la última década, como así lo demuestran las investigaciones a nivel internacional.

Sin embargo, y como ocurre en otros ámbitos, la mayoría de esta investigación proviene del contexto anglosajón (Heine, 2010; Medina, 2011a); siendo este tipo de investigaciones en España más bien escasas (ej. Vázquez, Férnadez-Molina, Planells-Struse, & Belmonte, 2014). La universalización de ciertas teorías, como las situacionales, hace que ciertos conceptos, que éstas proponen, se consideren globales sin tener en cuenta los aspectos culturales. Tal y como afirma Medina (2011a), uno de los mayores peligros del etnocentrismo es trasladar las mismas variables utilizadas en un contexto a otro. A pesar de vivir en un entorno globalizado, existen variaciones culturales que pueden tener efecto en la etiología de la delincuencia (Karstedt, 2001). Más aún, teniendo en cuenta que los factores situacionales están relacionados con el diseño urbano, el uso del espacio y con las actividades cotidianas de las personas, y que estas variables, a su vez, difieren según el país en el que nos encontremos, parece obvia la necesidad de comprobar si los elementos contextuales que han mostrado estar asociados a la delincuencia juvenil en otros contextos lo están en el nuestro. Por eso mismo, la relevancia del presente trabajo radica en la comprobación de hipótesis, bien establecidas en ciertos país, en contextos en los que no se han testado anteriormente.

Por otro lado, se debe de tener en cuenta que la prevención, uno de los principios recurrentes tanto en las directrices internacionales, como en la ley de responsabilidad penal del menor (L.O. 5/2000) o en el Plan de Justicia Juvenil de la CAPV, se plantea desde un modelo de bienestar que más bien se ocupa de cubrir las necesidades individuales o familiares, pero no de proporcionar estrategias preventivas que pudieran tener un impacto sobre los factores de riesgo personales, familiares o comunitarios (Medina, 2011b). Estrategias que necesitarían de un análisis integral de la casuística existente para poder inferir

aquellos elementos asociados a la delincuencia juvenil. En este sentido, se entiende desde la literatura científica que para que el análisis sea integral, todos los elementos –incluidos los situacionales- deberían ser investigados.

1.2.2. Objetivos y Estructura

Objetivos generales

El presente trabajo tiene como objetivos generales, por un lado, estudiar el fenómeno de la delincuencia juvenil desde una perspectiva situacional a diferentes niveles de análisis. Por otro lado, corroborar si las características socio-económicas y situacionales que en la literatura internacional muestran tener relación con la delincuencia juvenil, se mantienen en el contexto de la presente tesis o si, en cambio, son otras las variables que están asociadas.

Estructura

En la tesis se presentan diferentes capítulos asociados a los diversos estudios realizados. Así, en el capítulo 2 se recoge una investigación teórica que siguiendo una metodología de revisión sistemática de la literatura de los años 2010-2017 tiene como objetivo específico actualizar el estado de la cuestión del comportamiento antisocial juvenil, recogiendo las investigaciones que tuvieron en cuenta alguna de las principales teorías situacionales.

A partir del capítulo 3, inclusive, se recogen 5 investigaciones empíricas. Siguiendo una metodología no-experimental los diseños de investigación que se han planteado se podrían enmarcar en los estudios de tipo *transversal* y *predictivos transversales* –capítulos 3, 4, 5, 6 y 7. Como se puede observar en la tabla 1.1, se pueden diferenciar tres niveles en relación a la unidad de análisis de cada estudio. Así, en el nivel *macro* –capítulo 3-, la unidad de análisis sería municipal. En el nivel *meso* –capítulos 4 y 5-, la unidad de análisis serían las secciones censales de la ciudad de Bilbao. En último lugar, el nivel *micro* –capítulos 6 y 7- comprendería aquellos estudios en los que se ha considerado el

evento delictivo. En la tabla 1.1, se detallan los objetivos específicos planteados en cada estudio.

Tabla 1.1. Objetivos específicos de los estudios de la tesis.

Niveles	**Capítulos-Estudios**	**Objetivos específicos**
Macro: Municipios, Comunidad Autónoma del País Vasco	3	• Estudiar la asociación entre variables situacionales y de la oportunidad y las infracciones juveniles.
Meso: Secciones censales, Bilbao	4 5	• Explorar la concentración en el espacio de las infracciones violentas y no violentas. • Identificar las instalaciones y servicios que más se dan en los *hotspots* de infracciones violentas y no violentas. • Analizar la relación entre instalaciones y características socio-económicas y la localización de las infracciones juveniles. • Comparar las características de las secciones censales donde se identificó al menos una infracción, con aquellos lugares donde no se encontró ninguna.
Micro: eventos delictivos y desplazamientos a los lugares del evento, Comunidad Autónoma del País Vasco	6 7	• Describir la distancia que las personas menores recorren desde su domicilio al lugar del evento delictivo. • Estudiar la asociación entre características ambientales y la distancia recorrida al lugar del delito. • Explorar si existe estacionalidad en las infracciones violentas y no violentas. • Analizar si existe asociación entre distintas variables temporales y meteorológicas, y las infracciones violentas y no violentas.

- Estudiar si existe relación entre el tipo del lugar donde se produce el evento y las infracciones de tipo violento y no violento.

En el capítulo 8 se presentan de una manera general los resultados encontrados en cada uno de los estudios, se discuten los mismos desde una perspectiva global, y se finaliza describiendo las dificultades que se han tenido a lo largo de la tesis y proponiendo futuras líneas de investigación para la etapa postdoctoral.

Por último, es necesario decir que teniendo en cuenta la sensibilidad de los datos, el presente trabajo cumple con todos los estándares éticos necesarios como así lo certifica el informe positivo del Comité de Ética para las Investigaciones con Seres Humanos, sus Muestras y sus Datos (CEISH) de la Universidad del País Vasco UPV/EHU.

2.
Juvenile Delinquency: Situational and Opportunity Perspective

2.1. Introduction

Criminological literature has shown that juvenile delinquency is a complex phenomenon to explain, predict and prevent (Moffitt, 1993; Piquero & Moffitt, 2014; Wikström, 2004). Complexity can even be found in terminology; several terms are used in the current literature to label similar and/or overlapping juvenile behaviours (i.e. antisocial behaviour, disruptive behaviour, crime, offences or delinquency). Following (Morizot & Kazemian, 2015), in this paper we will use the terms 'antisocial behaviour' and 'juvenile delinquency' to label juvenile behaviours that are socially disruptive and/or against the law.

Most authors understand these behaviours as the result of an interaction between personal characteristics and the physical and social context (Redondo, 2015; Wikström, 2006). More attention has been paid to the personal, family, and social factors for understanding –and trying to prevent or reduce- juvenile delinquency. An example of this is the existence of a numerous prospective

longitudinal studies researching the life-course of the offender typologies stablished by the developmental criminology –life-course persistent, adolescent limited, and late onset offenders; interested readers can follow up in Jolliffe, Farrington, Piquero, MacLeod, et al. (2017) recently systematic review. Thanks to those works, it has been provided an essential list of individual, social and family risk factors such as, lack of guilt, family on welfare, or child abuse (Jolliffe, Farrington, Piquero, Loeber, & Hill, 2017), leading the research lines of the last three decades.

However, our interest lais in the environmental and situational influences on youth delinquecy, an area that tradittionaly has received less attention, until recently. In the years a considerable amount of studies have taken into account the role of environmental variables on juvenile delinquency (e.g. Bichler, Orosco, & Schwartz, 2012; Weerman et al., 2015; Wikström et al., 2012), exploring a great diversity of variables and, consequently, creating a large body of literature.

Thus, the aim of this review is to summarise the recent literature that considers situational factors implicated in the aetiology of juvenile delinquency or antisocial behaviour, to integrate the accumulated evidence and to draw future avenues for research.

2.1.1. Theoretical Backgrounds

In this context, it can be said that the origins of the current situational perspective can be traced back to the early works on moral statistics (Balbi & Guerry, 1829), the foundational studies on the location of the residence of juvenile delinquents carried out by Shaw and McKay (1942), or the proposals about the influence of the design of cities and neighbourhoods on criminal behaviour by Jeffery (1971) and Newman (1972). The contributions by these and other prominent authors helped establishing the main theoretical developments that now configure the situational perspective.

2.1.1.1. Routine Activity Theory (RAT)

The well-known proposal by Cohen and Felson (1979) states that the criminal event is the result of the concurrence of a motivated offender with a suitable target or victim with a lack of a capable guardian; therefore pointing to three elements that need to be coincident in time and space for the criminal event to happen. As a result, changes in the routine activities that bring together potential offenders at specific times and moments -thus affecting the opportunities for crime- are useful for understanding the crime rate fluctuations.

Osgood, Wilson, O'Malley, Bachman, and Johnston (1996) proposed that unstructured socialising is a key element when analysing juvenile delinquency from the routine activities' perspective. More specifically, Osgood et al. (1996) found that non-structured activities, presence of peers, and lack of authority figures were the variables related to antisocial behaviour.

Over the first decade of the 21st century, research using longitudinal and cross-sectional data on this field has bear out the hypothesis that time in unstructured activities increases the likelihood of juveniles to be involved in delinquency (Anderson & Hughes, 2009; Fleming et al., 2008; Osgood & Anderson, 2004). However, the opposite idea is unclear. That is, while some authors suggested a negative relationship between structural activities and antisocial behaviour (Mahoney & Stattin, 2000) others claimed the contrary (Gardner et al., 2009). On the other hand, some scholars have suggested that the company of peers and places without supervision are those that give valence to the type of activity on juvenile delinquency (Levine, Eileen, & Hernandez, 2004; McHale, Crouter, & Tucker, 2001).

2.1.1.2. Rational Choice approach (RC)

Cornish and Clarke (1986, 1987) proposed a rational choice perspective of the antisocial behaviour: potential offenders make a cost-benefits balance before

committing a crime and make the decision to act if expected benefits exceed perceived costs and risks.

The decision-making process that happens immediately prior to the transgression plays a core role for the authors. Cornish and Clarke (2008) defend that a juxtaposition of internal and contextual elements -information that is collected from the immediate environment- will provide the potential offender with enough perceived crime opportunities or will deter the antisocial behaviour. In this context, deterrence theory has been closely linked to the rational choice approach (Hirtenlehner, Pauwels, & Mesko, 2014) since the punishment or sanction can be seen as a potential risk for the offender that might cause deterrence (Andenæs, 1974; Pogarsky, 2009).

Early empirical studies from this perspective on juvenile delinquency have shown that perception of formal and informal sanction deters juvenile offenders (Wright, Caspi, Moffitt, & Paternoster, 2004). Scholars have also found that juveniles that have been arrested modify their risk perception. However, researches argue that deterring effect is different when considering individual characteristics (Keane, Gillis, & Hagan, 1989; Matsueda, Kreager, & Huizinga, 2006; Pogarsky, Piquero, & Paternoster, 2004). Thus, some authors have found that contact with the police has higher deterrence effect on females than in males (Keane et al., 1989); also, the likelihood of offending in juveniles is lower only if those perceive the arrest as a negative event (Matsueda et al., 2006). Regarding the perceived reward, Matsueda et al. (2006) found that the probability of offense increased for those juveniles expecting social support by their peers after commiting a crime.

2.1.1.3. Crime Pattern Theory (CPT)

The theoretical proposal by Brantingham and Brantingham (1981) offers an explanation for the spatial crime patterns that have been detected since the 21st century (e.g. Balbi & Guerry, 1829; Curman, Andresen, & Brantingham, 2015;

Sherman, Gartin, & Buerger, 1989). The crime pattern theory explains that individuals experience the urban space through their nodal points (e.g. home, work place, study centre, leisure areas, etc.) and the paths for moving from one node to another. The individual's nodes and routes configure the personal activity spaces, while areas seen from these nodes and paths –and therefore known- define the awareness space. Potential offender will tend to act in their awareness spaces, where they will be guided by the environmental signs for choosing a suitable setting. Empirical data on the distance decay function also reveals that most offenders commit crimes close to their residence, with the probability of crime decreasing when the distance from home increases, but only after the offender surpasses a security area around the house. These regularities in human spatial behaviour help us understanding offending. Moreover, some concrete settings will act as generators or attractors of crime (Brantingham & Brantingham, 2008) increasing the probability of an offence to happen.

Studies considering this perspective when exploring juvenile delinquency have found a consistent pattern over the years in a specific part of the city (Weisburd et al., 2009). Specifically, Weisburd et al. (2009), in an spatial longitudinal study in Seattle, found that most of the juveniles' offenses happened in a few street segments of the city. Results that backed up the hypothesis of the CPT. The evidence has also found that juveniles offend next to the places where they spend most of the time, namely, education centres, households, or their leisure nodes. An example of it are the surounding areas of the schools that have been found to be crime generators (Astor, Benbenishty, & Meyer, 2004; Schreck, Miller, & Gibson, 2003).

2.1.1.4. Situational Action Theory (SAT)

Keeping in mind that crime is a multilevel phenomenon, Wikström (2004, 2006) suggests an integrative approach where the criminal behaviour is the result of an interaction between the personal crime propensity and the criminogenic

exposure that happens in a concrete setting and time (Wikström et al., 2012). At the personal level, morality –understood as moral rules and moral emotions-, and self-control are considered. The criminogenic exposure will be determined by the environmental characteristics, and the author understands each place as a moral context, since each site has its own moral rules.

Research in this field have shown the relevance that lifestyles plays in juveniles' delinquency. A cross-national study measuring high risky lifestyles as having antisocial peers, alcohol consumption, and time in city centre during the evenings, found a positive relationship with self-reported violence (Wikström & Svensson, 2008). The authors also found that the effect of the lifestyles on violence behaviour was higher in those youths with higher crime propensity. Other studies in this field have also showed that those juveniles with higher propensity spent more time in criminogenic settings, linking both elements to higher likelihood of offending (Wikström, Ceccato, Hardie, & Treiber, 2010).

Overall, longitudinal and cross-sectional data have demonstrated the relevance of situational variables when explaining juvenile delinquency. Over the last two decades this perspective have been growing progressively, but it seems that over the second decade of the 21st century studies considering place and space perspective have exponentially increased (Bruinsma & Johnson, 2018).

Thus, being the objective of the present manuscript to carry out a narrative review of recent literature on situational factors implicated in the aetiology of juvenile delinquency, research from the point of view of these four theoretical perspectives will be considered, as it is explained in detail in the methods section.

2.2. Methods

2.2.1. Sample and search procedure

To reach the established objective, we relied on the following searching criteria:

- Aiming to collect evidence of the highest quality, we chose two databases of peer reviewed journals that are included in the Journal Citation Reports (JCR) or have a good reputation in the fields of interest (Psychology, Criminology, and Sociology). These were the Web of Science and PsycINFO.
- Knowing the exponential increase of the literature in this field over the las decades (Bruinsma & Johnson, 2018) and how quick it becomes outdate, we chose studies published between 2010 and 2017 considering our interest on the most recent empirical findings, and our concern on looking at the consolidation of the previous outcomes.
- The keywords used were the combination of the name of each one of the described theoretical approaches and each one of these words: juvenile, youth, young, adolescent, delinquency and offender. We use the name of the theories instead of a list of possible situational variables to detect the studied but also the non-studied variables from each theoretical proposal.

Applying these criteria, the first search found 1,070 papers that could be relevant for our objective. Titles and abstracts were read and 159 were selected for a full text screening after applying the following inclusion criteria: the papers should approach the juvenile delinquency and/or antisocial behaviour from one of the main situational theories (RAT, RC, CPT or SAT), and must analyse the role of situational factors for explaining delinquent or antisocial behaviour using quantitative methods. Treatment assessment studies, not related articles, those with only adult samples and theoretical works were excluded. In relation to the ages in the samples, the age interval included in the study should

start with minors of age according to the country of the study, and never include participants older than 28 years old.

After the full text screening, 88 articles met the described criteria (see Figure 2.1). This sample of papers was analysed in detail and the most relevant information was extracted and codified according to these categories:

- Sample: N of the sample, age of participants, city and country.
- Main theoretical framework: RAT, RC, CPT or SAT.
- Outcome variable: i.e. violent behaviour, offenses, substance use or any antisocial behaviour.
- Operationalisation of outcome variable: i.e. validated scale, interview, recorded or self-reported offense.
- Predictive variables: i.e. risk certainty perception, relevant place, unsupervised activities or lack of guardianship.
- Operationalisation of predictive variables: i.e. validated scale or self-reported behaviour and perceptions.
- Evidence: a summary of the main results regarding the situational variables.

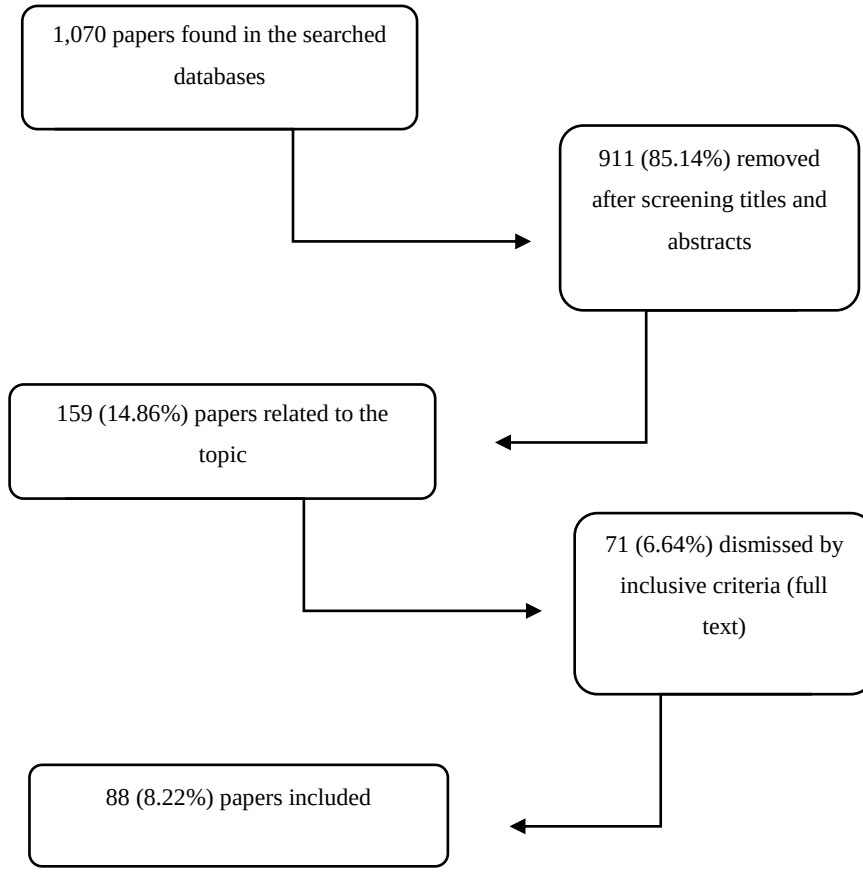


Figure 2.1. Searching and selection process

It is noteworthy to say that as the majority of these theories are complementary with each other, many of the studies overlapped in more than one category.

The information about the sample of each article is shown in table 2.1. As shown, the chosen studies have been numbered in order to facilitate the identification while explaining the findings.

Table 2.1. Infroamtion about the sample of the revied studies.

	Author/s (year of publication)	Country	Sample	Age
1	Ahlin, (2014)	USA	N= 1,767	9-19
2	Amemiya, Vanderhei, and Monahan (2017)	USA	N= 1,088	14-25
3	Anwar and Loughran (2011)	USA	N= 1,354	14-17
4	Archer, Fernández-Fuertes, and Thanzami (2010)	Spain	N= 601	15-19
5	Augustyn and McGloin (2013)	USA	N= 7,000	7th-12th grades
6	Augustyn and Ward (2015)	USA	N= 1,153	Mean = 16.5
7	Averdijk and Bernasco (2015)	Netherlands	N= 868	12-16
8	Berg and Loeber (2011)	USA	N= 5,875	1st, 4th, 7th grades
9	Bernasco, Bruinsma, Pauwels, and Weerman (2013)	Netherlands	N= 616	11-18
10	Bernasco, Ruiter, Bruinsma, Pauwels, and Weerman (2013)	Netherlands	N= 76	12-16
11	Bichler, Christie-Merrall, and Sechrest (2011)	USA	N= 2,563	10-17
12	Bichler, Orosco, and Schwartz (2012)	USA	N= 2,563	10-18
13	Boivin and D'Elia (2017)	Canada	--	--
14	Browning, Soller, and Jackson (2015)	USA	N= 830	12-17
15	Bruinsma, Pauwels, Weerman, and Bernasco (2015)	Netherlands	N = 843	12-16
16	Burt and Rees (2015)	USA	N= 7,394	7th -12th grades
17	Chui and Chan (2012)	China	N= 1,377	12-17
18	DeCamp and Newby (2015)	USA	N= 8,984	12.7-14.6
19	Desmond, Bruce, and Stacer (2012)	USA	N= 200	7th -12th grades
20	Fox and Bouffard (2015)	USA	N= 8,433	12-16
21	Gallupe and Baron (2014)	Canada	N= 300	16-24
22	Hirtenlehner and Hardie (2016)	Austria	N= 2,911	12-15
23	Hirtenlehner, Pauwels, and Mesko (2014)	Belgium, Sweden, Slovenia	N= 2,911; N= 1,225; N= 409	13-14; mean= 13; mean = 16
24	Hirtenlehner and Treiber (2017)	Austria	N= 2,911	7th , 8th class
25	Hoeben and Weerman (2014)	Netherlands	N= 615	11-20
26	Hoeben and Weerman (2016)	Netherlands	N= 610	11-20
27	Hughes and Short (2014)	USA	N= 490	12-21
28	Janssen, Eichelsheim, Dekovic, and Bruinsma (2016)	Netherlands	N= 615	11-17
29	Jennings, Higgins, Tewksbury, Gover, and Piquero (2010)	USA	N= 407	12-16
30	Johnson and Summers (2015)	UK	--	--
31	Kim, Pratt, and Wallace (2014)	USA	N= 1,156	11-17
32	Lane and DeCamp (2017)	USA	N= 7,781; N= 4,019	9th -12th and University
33	Lee (2015)	South Korea	N= 2,684	15-19
34	Letourneau, Bandyopadhyay, Armstrong, and Sinha (2010)	USA	N= 26,574	14-17
35	Leverso, Bielby, and Hoelter (2015)	USA	N= 1,088	14-20
36	Li, Lo, Cheng, and Wu (2012)	China	N= 200	10-17
37	Loughran, Paternoster, Chalfin, and Wilson (2016)	USA	N= 1,354	14-17
38	Loughran, Paternoster, Piquero, and Pogarsky (2011)	USA	N= 7,437	14-17
39	Loughran, Piquero, Fagan, and Mulvey (2012)	USA	N= 1,100	14-17

40	Loughran, Pogarsky, Piquero, and Paternoster (2012)	USA	N= 8,932	14-17
41	Maimon, Antonaccio, and French (2012)	USA	N= 7,660	7^{th} -12^{th} grades
42	Maimon and Browning (2010)	USA	N= 780	9-12
43	Maimon and Browning (2012)	USA	N= 842	8-13
44	Maldonado-Molina, Jennings, Tobler, Piquero, and Canino (2010)	USA	N= 1,138	5-13
45	Maxson, Matsuda, and Hennigan (2011)	USA	N= 144	< 17.5
46	McCabe, Modecki, and Barber (2016)	Australia	N= 687	14-16
47	McCuish, Corrado, Hart, and DeLisi (2015)	Canada	N= 326	12-28
48	McGrath and Weatherburn (2012)	Australia	N= 6,196	Young offenders
49	Meldrum and Clark (2015)	--	N= 426	Mean= 15
50	Menard and Covey (2016)	USA	N= 2,965	12-17
51	Miller (2013)	UK	N= 3,435	11-18
52	Na (2017)	USA	N= 1,300	14-19
53	Nguyen, Loughran, Paternoster, Fagan, and Piquero (2017)	USA	N= 615	14-17
54	Osborne, McCord, and Higgins (2016)	USA	--	5-17
55	Pauwels and Svensson (2013)	Belgium	N= 1,554	13-14
56	Pauwels, Weerman, Bruinsma, and Bernasco (2011)	Netherlands	N= 843	11-18
57	Pauwels and Svensson (2010)	Belgium, Sweden	N= 2,486; N= 1,003	12-17; mean = 15
58	Peguero (2013)	USA	N= 9,870	School students
59	Pooley and Ferguson (2017)	Australia	N= 26,380	0-16
60	Pyrooz, Decker, and Moule (2015)	USA	N=341	Mean = 24.9;22.7
61	Pyrooz, Moule, and Decker (2014)	USA	N=621	Mean= 26.70
62	Reingle, Jennings, Maldonado-Molina, Piquero, and Canino (2011)	USA	N= 1,138	5-13
63	Resko et al. (2010)	USA	N= 1,050	14-18
64	Schepers (2017)	Germany	N= 1,690	$6t^{h}$, 10^{th} grades
65	Schulz (2014)	UK	N= 1,279	16-25
66	Shulman, Monahan, and Steinberg (2017)	USA	N= 1,169	14-17
67	Steketee, Junger, and Junger-Tas (2013)	International	N= 57,940	adolescents
68	Svensson (2015)	Sweden	N= 891	Mean= 15
69	Svensson and Pauwels (2010)	Belgium, Sweden	N= 2,264; N= 898	12-17; mean = 15
70	Svensson, Weerman, Pauwels, Bruinsma, and Bernasco (2013)	Netherlands	N= 843	11-18
71	Sweeten, Piquero, and Steinberg (2013)	USA	N= 1,354	14-17
72	Tanner, Asbridge, and Wortley (2015)	Canada	N= 3,362	13-18
73	Taylor and Khan (2014)	Australia	N= 629	10-17
74	Thomas, Loughran, and Piquero (2013)	USA	N= 1,354	14-17
75	Thomas and Mcgloin (2013)	USA	N= 8,989	7^{th} – 12^{th} grades
76	Turanovic, Reisig, and Pratt (2015)	USA	N= 4,533	11-26
77	Van Gelder, Averdijk, Eisner, and Ribaud (2015)	Switzerland	N= 1,675	Mean= 7.45-15.4
78	Vogel and South (2016)	USA	N= 6,491	12-16
79	Ward, Boman, and Jones (2015)	USA	N= 2,243	7^{th} -12^{th} grades
80	Ward, Krohn, and Gibson (2014)	USA	N= 595	Mean= 16.47
81	Weerman, Bernasco, Bruinsma, and Pauwels (2015)	Netherlands	N= 843	11-18
82	Weerman, Bernasco, Bruinsma, and Pauwels (2016)	Netherlands	N= 843	12-18
83	Wikström, Ceccato, Hardie, and Treiber	UK	N= 650	13-17

	(2010)			
84	Wikström and Treiber (2016)	UK	N= 657	13-17
85	Wikström, Tseloni, and Karlis (2011)	UK	N= 703	14-15
86	Wilson, Paternoster, and Loughran (2017)	USA	N= 2,937	14-17
87	Wissink et al. (2014)	Netherlands	N= 670	12-20
88	Zimmerman and Rees (2014)	USA	N= 10,299	7^{th} -12^{th} grades

2.3. Results

Figure 2.2 depicts the trend of the selected studies over the 8 years period. As can be seen, a gradual increment on the number of the selected papers happens during 2014 (N= 11) reaching the highest peak (N=20) in 2015. In 2016, a significant decrease can be seen (N= 9) and 2017 offers a number similar to those at the beginning of the period (N= 10).

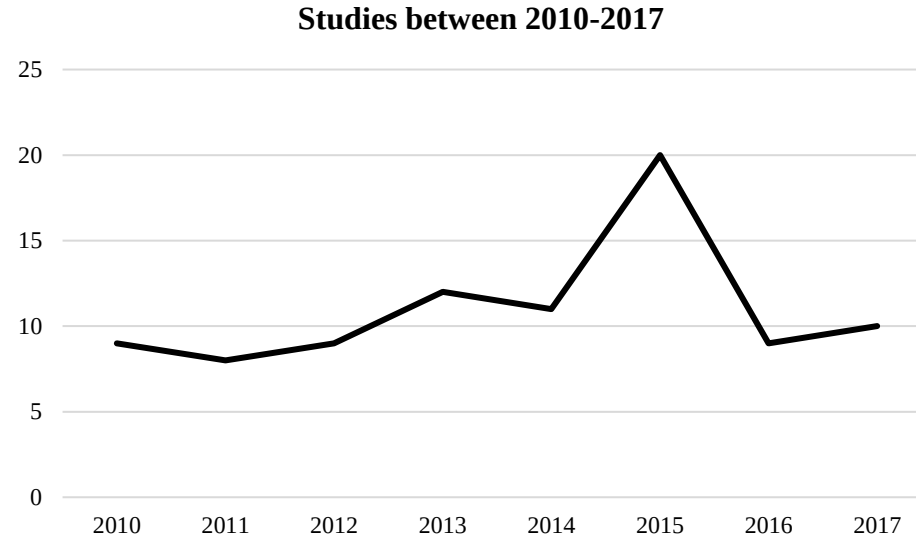


Figure 2.2. Summary of the sample of studies over the last eight years.

The location of the cities where the studies were carried out can be seen in Figure 2.3. As displayed in the map, elaborated with the software QGIS (QGIS Development Team, 2009), most studies were carried out in the United States (N=47) followed by the Netherlands (N=12) and the United Kingdom

(N=6). In the remaining countries, between 1 and 5 studies focused on situational aspects of juvenile delinquency were found.

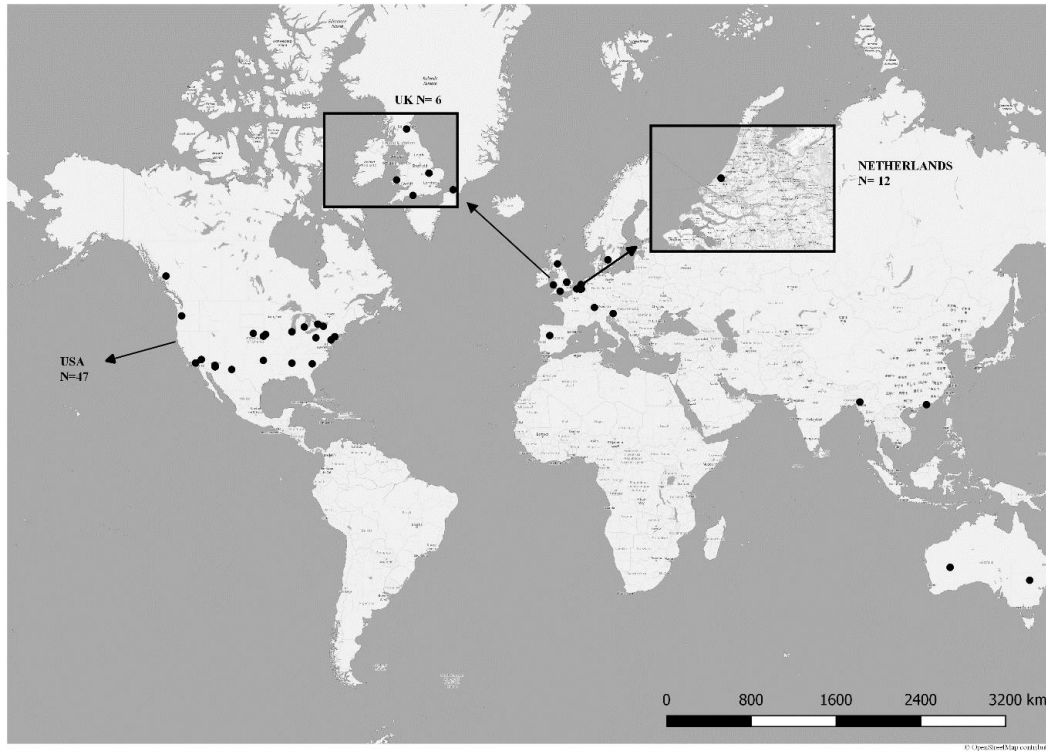


Figure 2.3. A map of the countries with most studies and the samples' cities.

In Table 2.2, we offer a summary of the literature review structured according to each predictive category. A brief description of the more relevant situational factors associated with juvenile delinquency is presented in this section. The gathered information is reported for each relevant variable, since some of them can be considered or interpreted from more than one theoretical approach.

2.3.1. Unstructured socialising

A number of studies included in this review have found an association between unstructured socialising (or one of its main elements: deviant peers, absence of authority, and unstructured activities) and the juvenile delinquency.

Hoeben and Weerman (2016) found evidence of a direct effect of unstructured socialising on theft and vandalism: 1 hour of unstructured socialising increased the probability of theft by 6.3%, and vandalism by 3.1%. The authors did not find a direct effect on violent behaviour, but antisocial peers had a mediator effect in violent behaviour, as well as in thefts, vandalism, and general delinquency. Maimon and Browning (2010) did find a significantly direct relationship between unstructured socialising with peers and violent behaviour. Paying attention to the physical context, Hoeben and Weerman (2014) found that the space where unstructured socialising happens determined the association to offenses. In semi-public and public settings (compared to private space) unstructured socialising was more likely to result in involvement in delinquent behaviours.

If we focus on activities, time spent by adolescents in unstructured and unsupervised activities, like hanging out with peers without supervision or without a specific plan, is found to be a strong predictor of the juvenile delinquency (see 7, 9, 10, 15, 25, 26, 27, 28, 42, 43, 47, 49, 51, 55, 61, 67, 72, 74, 77, 81, 83, and 84). In addition, some authors have found a strong relationship between the risky leisure time and violent and property crimes committed by teenagers (Tanner et al., 2015).

Unstructured activities increase the risk of delinquent behaviour, but structured and well-organised activities do not necessarily prevent it (see 17, 33, and 46). Chui and Chan (2012) showed a positive relationship between organised activities and the likelihood of delinquency. This finding goes along with McCabe et al. (2016) that suggested that those adolescents who were involved in sport activities, had higher risk of substance abuse (see Lee (2015) as well).

Considering the role of antisocial peers, several studies have confirmed a strong influence on delinquent behaviour (see 2, 5, 8, 9, 15, 19, 20, 21, 22, 24,

26, 28, 29, 42, 43, 44, 51, 52, 53, 55, 61, 62, 64, 67, 69, 71, 75, 77, 78, 80, 82, and 84). Antisocial peers increased the probability of substance abuse, such as alcohol consume (Burt & Rees, 2015; Miller, 2013), violent behaviour (Hoeben & Weerman, 2016; Hughes & Short, 2014; Maimon & Browning, 2010; Tanner et al., 2015), vandalism, theft, or general delinquency (Hoeben & Weerman, 2016). Hoeben and Weerman (2016) suggest that antisocial peers act as situational motivators.

Finally, the absence of an adult or the lack of a capable guardian increases the likelihood of a juvenile offence (Weerman et al., 2015). A better parental control over juveniles could prevent spending time in unstructured activities or with antisocial peers (see 9, 10, 28, 29, 42, 49, 51, 55, 57, 59, 67, 75, 81, and 82). Moreover, Augustyn and McGloin (2013) found that an effective parental control deters juveniles from committing predatory offenses and using substances.

2.3.2. Social bonds and collective efficacy as guardianship

In order to study the guardianship concept, a number of researchers included in the present review have examined the role of social bonds and collective efficacy as delinquency deterrents (see 14, 17, 20, 28, 33, 42, 43, 44, 51, 55, 57, 67, 71, 72, 75, 80, 82, and 87). These variables have been found to affect antisocial behaviour in several ways: i.e. neighbourhoods with higher levels of informal control reduce the positive effect of unstructured activities on juvenile delinquency (Maimon & Browning, 2010, 2012); weak social bonds are associated with juvenile offenses (Lee, 2015), while strong social bonds might deter crime: parental bonding and school commitment are associated with less thefts and violent offences (Chui & Chan, 2012), and religious commitment, school commitment, and family attachment have effect against hanging out with peers and individual marijuana consume (Fox & Bouffard, 2015).

2.3.3. Risky lifestyles and victimisation

The third element in Cohen's and Felson's (1979) approach is the suitable target/victim. Victimisation could also help understanding delinquency; a number of studies include in the current review have investigated victim-offender overlap from the RAT perspective (see 7, 8, 10, 18, 20, 43, 44, 50, 58, 76, and 77). From this approach, it is assumed that due to the lifestyles and routine activities of juvenile delinquents they will be often victimised. For example, Maldonado-Molina et al. (2010) found that 27% of their Puerto Rican youth sample were both victims and offenders. Moreover, their structural model showed a moderate-strong relationship between victimisation and offending. It is noteworthy that the victim-offenders group showed higher levels of risk in the individual, familiar, peers, and contextual domains. Similarly, Averdijk and Bernasco (2015) and Turanovic et al. (2015) reported that being an delinquent, particularly violent delinquent, was the better predictor of being victimised. DeCamp and Newby (2015), using a sample of bullying victims, found that being bullied was associated with a higher risk of antisocial behaviour, but the direction of the relation between these two variables remains unclear.

Other authors (Berg & Loeber, 2011) have investigated how social disadvantages affect the victim-offender overlap. The findings showed a positive relationship between the two variables: juveniles who spent more time in criminogenic spaces and were involved in delinquency had a higher risk of being victimised than those who lived in a neighbourhood with less social disadvantages. With an immigrant sample in the US, Peguero (2013) also found that victimisation could be explained by routine activities and lifestyles. Once again, being involved in delinquent behaviour increased the likelihood of being victimised.

2.3.4. Online behaviour

Internet use has changed the way people communicate, interact and spend leisure time. In this context, we only found a single study that contemplated the online antisocial or delinquent behaviour of the juveniles. Pyrooz et al. (2015) found that gang members spend more time on the Internet than no-gang members do and, therefore, those had more likelihood of being involved in online delinquency.

2.3.5. Risk and cost perception

Some authors have focused their attention on the deterrence effect that the perception of risk of being arrested or sanctioned could have on a possible delinquent behaviour (see 3, 21, 22, 25, 31, 35, 37, 38, 39, 40, 45, 56, 65, 68, 74, 85, and 86). Studies such as the one by Loughran, Piquero, et al. (2012) or Schulz (2014) found that high-rate offenders perceived higher possibilities of benefit and less risks while low-rate offenders had the opposite pattern of perception. Moreover, the literature shows that floor and ceiling effects exist in relation to the perception of risk of being sanctioned (Loughran, Piquero, et al., 2012) with juveniles under the floor value not considering the possibility of a sanction. There is also a tipping effect threshold: over this threshold, the high perception of risk will deter the behaviour (Loughran, Pogarsky, Piquero, & Paternoster, 2012).

Researching juveniles' contact with the police, the literature suggests that the experience of being arrested can increase the perception of risk; however, juveniles with less experience with crime pay more attention to prior experiences than those who maintain antisocial behaviour at a regular basis (Anwar & Loughran, 2011). Ward, Krohn, and Gibson (2014) found a positive relation between contact with the police and violent behaviour that could be interpreted also as continuous involvement in crime not increasing the risk perception. For Thomas et al. (2013) there is an update of the risk perception

after a crime experience, but individual characteristics related to crime propensity play a role in the process (see also Hirtenlehner et al., 2014). In their study, adolescents with low verbal intelligence and early delinquent behaviour used their own crime experiences –such as being caught- to update their risk perception. In contrast, adolescents with moderate or high verbal intelligence level and without early delinquent behaviour experiences did not update the risk perception after being arrested, so they might not associate each antisocial event with the previous one and the arrest would not affect their risk perception, deciding whether to act again based on contextual features.

When studying specifically the perceived risk of sanction or punishment, most studies included here suggest that the effect of the perceived formal sanction on delinquency is weak or null (see 6, 34, 37, 39, 41, 48, 56, 66, 70, 73, 87, and 88). For instance, in a study with school pupils, Maimon et al. (2012) found that the decision-making process, which has a negative effect on violent behaviour, was less useful for those schools with harsher sanctions. On the contrary, a decision-making process was important for a context where the school was more tolerant. However, other authors have found a strong direct effect of harsh sanctions on the juveniles' antisocial behaviours (Augustyn & Ward, 2015; Zimmerman & Rees, 2014). Specifically, Pauwels et al. (2011) found a negative effect of perceived risk of sanction on vandalism, burglary and assault.

Not only formal sanctions have been studied; juvenile delinquents may consider informal sanctions before offend (Kim et al., 2014; Li et al., 2012) or other costs such as anticipated guilt and shame (see 4, 37, 39, and 66).

2.3.6. Rewards Perception

The benefits that juveniles can obtain from delinquent behaviour will strongly affect the decision to act. In this sense, Li et al. (2012) clustered the

rewards in two groups: tangible rewards of crime commission, regard to the materialistic stolen items; and intangible rewards of crime commission, those related to social needs of the delinquents and non-materialistic (see 4, 37, 39, and 66).

Loughran et al. (2016) found that in the cost-benefit calculation, the benefits have more weight than the costs (see also Li, 2015). Additionally, the authors showed that, among the serious juvenile delinquents, drug, violent and property offenses are more influenced by the anticipated reward. Specifically, social rewards (i.e. being respected by peers) have more impact for violent offenses than for robbery or delinquency related to drugs.

2.3.7. Additional variables

In order to investigate the decision-making process by juvenile delinquents, some authors have introduced other elements that may interfere in the process. For example, Ahlin (2014) showed the influence of internal locus of control (ILOC) concluding that those adolescents with ILOC were less likely to get involved in violent behaviours. The relationship was maintained after controlling familiar and contextual variables.

On their behalf, Archer et al. (2010) considered the role of self-control, finding that cost-benefit calculation (a more reflective system) and self-control (a more impulsive system) simultaneously predicted physical aggression in juveniles. The authors suggested that the simultaneous effect is due to a dual-process model of social cognition: on the one hand, there is a logical decision-making system and, on the other hand, a more impulsive, faster and simpler information process (see also Thomas and Mcgloin 2013). More specifically, Archer et al. (2010) showed that while higher self-control and higher cost perception predicted the nonviolent behaviour, lower self-control and lower cost perception anticipated aggressive behaviour.

2.3.8. Relevant spaces

According to the CPT, the nodes and paths we use configure our experience of the city. Most studies included in this review found that the places where juveniles usually offend are those where they spend more time on. Thus, juveniles' leisure areas and routine activities areas, such as schools, their homes, or public and semi-public leisure places, build their action area (see 7, 11, 12, 13, 30, 54, and 83). According to Johnson and Summers (2015) the settings of juvenile delinquents were located close to where they lived, as well as close to their leisure nodes. They preferred settings far away from the city centre, and the authors suggested that those findings can be biased by the delinquents' home location and the preference for committing offenses around their households (see also Bernasco, 2010; Boivin & D'Elia, 2017). Also Tanner et al. (2015) found a relationship between the location of risky leisure activities and property and violent offenses (see similar findings: 11, 30, 54, and 83).

On the other hand, prosocial places could be settings where adolescents engage in self-improving activities and therefore could deter delinquency. However, a number of authors have found a strong association between prosocial places and delinquent activities (see 13, 30, and 54). Osborne et al. (2016) showed a significant positive effect of prosocial settings on violent assault with weapon. Moreover, there was a significant interaction between prosocial and poverty areas, and therefore the authors suggest that prosocial institutions are related to delinquent behaviour in socioeconomic disadvantaged areas, acting as generators of violent antisocial behaviour. Therefore, the location of schools and other prosocial places where juveniles spend time acts as another node in relation to offending behaviour.

In contrast to the findings above, Browning, Soller, and Jackson (2015) suggest that juveniles involved in conventional activities promote prosocial goals, and in consequence the likelihood of risky behaviours will be reduced. In

their study, researching eco-networks –the intersection of an individual's activities location and individual's neighbourhood residence– as protective areas, Browning, Soller, and Jackson (2015) concluded that reinforcing eco-networks increases the negative relationship with antisocial behaviours such as substance use and delinquency. The authors infer that eco-networks provide familiarity, public trust, monitoring, and other protective factors that might decrease the delinquent behaviour.

2.3.9. Journey to crime

Regarding the distance that juvenile delinquents travel to offend, the majority of the studies include in the present review showed that juvenile travelled less distances except when they have access to a motor vehicle. Additionally, the literature also shows that the trip is conditioned by the location of their household: city centre, isolated place, social disadvantages, or population density of the neighbourhood (see 11, 12, and 30). For instance, Bichler et al. (2012) found that variables such as income, juvenile population, or household density of an area influenced the travelled distance. In addition, as expected, access to a private vehicle increased the likelihood of travelling further. Moreover, a private vehicle access enhanced spending time in unstructured activities such as hanging out with peers, which is associated with antisocial behaviour.

Moreover, Bichler et al. (2011) found that juveniles use their journey to school to elaborate an antisocial context; this is, to know better the structure of the geographical area and its features. The authors discovered that the median distance to the event was larger than other studies suggested. As previously mentioned, the location of the house is relevant: young offenders travelled longer distances when they lived in remote places, in comparison to adolescents living in the centre of the cities. The authors highlight that taking in consideration the features of the settings where offences happen is essential.

2.3.10. Criminogenic exposure

Wikström and Treiber (2016), when considering the completely theoretical perspective, stated that crime propensity and criminogenic exposure are the strongest and the most consistent predictors in juvenile delinquency, explaining together the 55.6% of the variance. Focusing on criminogenic exposure, other studies confirm the relevance of this factor: the environment may enhance the likelihood of consuming drugs (Gallupe & Baron, 2014) and settings affected by psychopathic individuals would guide others to violent situations (McCuish et al., 2015).

Table 2.2. Resume of the found evidence of situational predictible variables.

Predictive Category	Predictive Variable	Studies	Evidence
Unstructured Socialising/Criminogenic exposure**	Antisocial peers**	2; 5; 8; 9; 15; 19; 20; 21; 22; 24; 26; 28; 29; 42; 43; 44; 51; 52; 53; 55; 61; 62; 64; 67; 69; 71; 75; 77; 78; 79; 82; 84.	A large body of the literature shows a direct effect between antisocial peers and a delinquent event.
	Peer presence	5; 7; 10; 16; 43; 81.	The majority of the studies suggest a positive effect between peer presence and a delinquent event. However, some scholars did not find significant outcomes and others found a negative effect.
	Unstructured and Unsupervised Activities with peers**	7; 9; 10; 15; 25; 26; 27; 28; 42; 43; 47; 49; 51; 55; 61; 67; 72; 75; 77; 81; 82; 83; 84.	The vast majority of the studies display a direct effect of unstructured and unsupervised activities with peers and juvenile delinquency. Few cases do not show a significant effect.
	Structured Activities	17; 20; 27; 29; 32; 46; 51; 55; 58; 72.	The evidence shows mixed results: although a number of studies find a positive relationship with the juvenile delinquency, some studies find a negative effect.
	Absence of Adult Handler/Parental Monitoring	9; 10; 28; 29; 42; 49; 51; 55; 57; 59; 67; 75; 81; 82.	The majority of the scholars conclude a positive relationship between the lack of control of a handler adult and juvenile delinquency. However, there is evidence that have found a negative effect in some specific cases.
Guardianship/ Informal Controls/ Criminogenic exposure**	Social bonds	14; 17; 20; 28; 33; 42; 43; 44; 51; 55; 57; 67; 71; 72; 75; 79; 82; 87.	Although a considerable body of the literature displays a negative relationship with the juvenile delinquency, there are some studies that do not find significant
	Collective Efficacy**	14; 20; 42; 43; 83; 84.	The evidence displays that two of the studies show a positive relationship, while four display a negative effect and one do not find significant results.

Risky Lifestyle	Use of Alcohol	7; 8; 10; 27; 43; 47; 55; 63; 69; 77; 81.	The majority of the literature point a positive effect on the juvenile delinquency. Few are the studies that do not find a significance relationship.
	Use of Drugs	8; 10; 47; 76; 77; 81.	Most of the studies do not find a significance relationship. However, one study show a positive relationship.
	Victim-Offender overlap	7; 8; 10; 18; 20; 43; 44; 50; 58; 76; 77.	The majority studies support a victim-offender overlap
	Nightlife	51; 69.	Two studies show a positive relation with juvenile delinquency.

(*Continued)*

Table 2.2 (Continued).

Predictive Category	**Predictive Variable**	**Studies**	**Evidence**

Online Behaviour	Spent time	60.	A study concludes a positive relationship spending time online and delinquency
Risk and Costs Perception	Likelihood of being arrested/caught perception (Certainly of punishment)	3; 21; 22; 23; 31; 35; 37; 38; 39; 40; 45; 56; 65; 68; 74; 85; 86.	The majority of the evidence suggest a negative effect between delinquency and the perception of the risk of being caught.
	Perception of Formal Sanctions	6; 34; 37; 39; 41; 48; 56; 66; 71; 73; 87; 88.	The majority studies depict little support of the deterrence hypothesis of the sanctions. Most of the studies did not find a significant effect or they found a positive effect. Moreover, the negative effect found was small.
	Severity of the Sanction	45.	A negative small effect was found.
	Perceived shame and guilt (Informal Sanctions)	4; 31; 39; 45; 66; 70.	The evidence concludes the existence of a negative effect. However, one of the studies found a positive effect and two did not find a significant effect.
Reward Perception	Perceived Intangible Reward	4; 37; 39; 66.	A vast majority of the literature concludes a positive relationship between perceived intangible reward and juvenile delinquency
	Perceived Tangible Reward	36.	The find study related positively perceived tangible reward with juvenile delinquency.
Additional Variables	Internal Locus of Control (ILOC)	1.	A negative effect was found between ILOC and juvenile delinquency
Relevant Spaces	Home Address	13; 30.	The majority of the evidence displays a positive effect between juvenile delinquency and areas near of their homes.
	Public spaces	7; 25.	Public spaces show a positive effect with juvenile delinquency
	Activity Nodes (leisure activities or schools)	11; 30; 54; 83.	The majority of the evidence shows a positive effect of the activity nodes, such as leisure places or prosocial places with juvenile delinquency.

	Reinforcement Eco-Networks	14.	The literature shows a negative effect with the delinquency.
Journey to Crime	Distance	11; 13; 30.	Most of the study showed negative relationship related to the distance travelled by juveniles to offend. Thus, they travel less distance.

(*Continued)*

Table 2.2 (Continued).

Predictive Category	**Predictive Variable**	**Studies**	**Evidence**

Travel by vehicle*	11; 12.	The literature showed a positive effect with the distance travelled by juveniles to offend.
Travel by non-vehicle*	11.	A study shows a negative relationship between the travelled distance and travel without vehicle.
Living in the Core-city*	11.	A study shows a negative relationship between living in the city centre and travel more distance to offend.
Living in an Isolated places*	11; 12	The literature displays a positive effect with the covered distance by juveniles to offend when they live in isolated places.
Age*	11.	A study concludes that there is a positive effect between the age and the travelled distance. The older the juvenile is the more he/she travels to offend.
Presence of youth in the neighbourhood* +	12.	The literature shows that the more juveniles in the area the less juveniles travelled. Thus, the evidence shows that the more juvenile in the area the more juvenile delinquency.
Household income media in the neighbourhood*	12.	A study displays a negative relationship between home income average in the area and juvenile delinquency.

*Relationship within the distance travelled. Thus a positive relationship more distance and a negative relationship less travelled distance.
**Variables include in Criminogenic Exposure category.
+ Relationship with juvenile delinquency

2.4. Discussion

Recapitulating, this narrative review intends to contribute to the literature on juvenile delinquency by synthesising the current evidence gathered from situational perspectives. As described above, a substantial amount of evidence has showed the effect of situational, opportunity and/or environmental variables on the aetiology of juvenile antisocial or delinquent behaviour. However, and far away from simplistic associations, we also defend that individual and social level variables are needed for fully understand this (and any other) behaviour; particularly when analysing aggressive or antisocial behaviours. While presenting the results, interactions and mediation relations provided support for this statement.

The exposed review has also been useful, in our view, to detect research topics where more evidence is needed for understanding and/or clarifying the roles of some variables and processes. Evidence of unstructured activities increasing the risk of antisocial behaviour is strong; however, as previously exposed, structured and well-organised activities do not necessarily prevent it. More research would be necessary for understanding why some structured activities, as some prosocial places, are not able to play a protective role. We could assume that the activity or place that reduces the probability of juvenile crime is not necessarily the opposite of the one that makes it easier to happen.

Online antisocial behaviours, more and more common in our societies, also deserve further research to establish if the internet is just another channel for communication (i.e. among members of gangs) and commission of those behaviours, or the virtual settings have specific characteristics that demand new proposals for understanding and eventually trying to prevent online juvenile delinquency. We should not forget that violence and/or aggression do not finish when we leave the physical world and enter the internet; abuse, bullying and other antisocial behaviours can happen online or both in real and digital settings.

How perception of risks of being captured and sanctioned evolve because of prior experiences shows that variables that influence the decision-making process can be dynamic, another topic where additional research is needed, analysing situational aspect in interaction to personal and social variables.

We should also consider that research about the perception of potential sanctions offers ambiguous outcomes, revealing that further research is needed regarding this issue. Similarly, guardianship is a very powerful concept that has mostly been considered as parental supervision but should be broaden in future research. It could be appropriate to try to detect "best parental supervision practices", keeping in mind that just any kind of supervision does not guarantee a successful socialisation process. A failed style of supervision, without a coherent and contingent system of reinforcements could have the same undesirable results that parental neglect.

A general conclusion in relation to the evidence about criminogenic exposure, path to the event place, relevant spaces, or risk perceptions, is that most studies have operationalised those variables from the social function they play; for instance, prosocial places, leisure time with peers, juveniles' households and so on. However, less attention has been paid to the urban design, even though it has been considered to influence the individual's behaviour (Rapoport, 1977; Wicker, 1979). A good example is the finding that unstructured socialising in a semi-public and public setting was more likely to result in involvement in an antisocial, even aggressive, behaviour, in comparison to private spaces. We still need to understand much more about the nature of the spaces of juvenile delinquency. Additionally, more attention should be paid to understand the role of places that have the function of crime generators or attractors for juveniles, and how they perceive signs in their environments.

As concluded by Martínez-Catena and Redondo (2013), in relation to the intervention strategies that could be designed based on our understanding of the causes of juvenile delinquency, and even when some effective programmes at the social and personal level are available, it is still necessary to develop new preventive programmes that include situational and contextual variables for being able to reduce the probability of juvenile delinquency. Therefore, situational prevention measures could not only help dissuading deviant juveniles but could also increase the efficacy and efficiency of re-education programmes (Summers, 2009). Moreover, situational and contextual prevention measures can have collateral benefits such as the participation of diverse social groups, the improvement of lifestyles in cities or the adoption of new multidisciplinary police perspectives and new urban policies for restoring urban environments (Fennelly & Crowe, 2013).

However, it is possible that we are not able to avoid the critical views on situational prevention strategies (Campoy-Torrente & Summers, 2015; Medina, 2011b; Vozmediano & San Juan, 2010) even when the most commonly criticised aspect is the possible displacement effect and most evidence shows that displacement is usually low or non-existent (Medina, 2011b; Vozmediano & San Juan, 2010).

2.5. Limitations

We should also acknowledge some limitations of the exposed work. First, our review only examined articles written in English. Additionally, we chose two high quality databases but did not use any strategy for gathering the so-called grey literature. Moreover, using the theories names as keywords might have left behind some situational variables hidden under names of other theoretical approaches. Beyond those limitations and considering the high number of articles included and the strong evidence found for some variables, we believe that the method allowed us to summarise a considerable amount of useful

information and to present the current state of the art of the situational and opportunity variables to explain juveniles' antisocial and delinquent behaviour.

2.6. Final thought

To sum up, we have exposed how the literature on situational and opportunity factors is helping to better understanding of juvenile delinquency. At the same time, we pointed out to the need of further research in some topics, underlying the need to pay more attention specifically to the features of the place and its design. We expect to have contributed to build a broader vision where the effect of situational factors is also considered for understanding of the causes of juvenile delinquency and antisocial behaviour.

As a final thought, and after mentioning the multilevel aetiology of the juvenile crime several times across the paper, we cannot fall into the temptation of treating situational, social and individual level variables as hermetic containers. We believe that the environmental and situational perspective is better understood from a multiphase point of view, since those variables are not disconnected from psychological or social ones. From our perspective, juvenile crime would be a process that probably starts while developing non-structured activities with antisocial peers (Routine Activity Theory). Here we should remember that no youth is fully passive when becoming a part of a group of friends. Personality traits such as the absence of fear, risk perception or impulsivity could influence how certain profiles are chosen as friends. Similarly, the exploration of the surrounding environment could be improvised but it is not random since it will be conditioned by the centripetal effect played by the significant spatial nodes of these juveniles (Crime pattern theory), such as the location of the residence or urban spaces frequented by groups of youths (areas where nothing is done, because we have to keep in mind that doing nothing but spending time can be a routine activity for adolescents; as a way of non-structured leisure time). Knowing that urban design often locates different

socio-economical levels in separate areas of the city, the location of the family in the socio-economical pyramid will influence the socio-economical level of the peers, as well as the areas of the city that this group will have frequent access to. From this point on, several scripts that end in juvenile delinquency and antisocial behaviour are possible, such as the absence of a capable tutor, or the observation of a desired objective. It could be precisely the activity of doing nothing in an urban area the reason of starting a deliberative process on how to spend time, which could ultimately lead to vandalising, fights, thefts, robbery and/or, assaults in the worst cases. In other words, in the described situation antisocial behaviours have been included in the personal catalogue of routine activities instead of structured alternatives of leisure that the juvenile did not have access to -or simply, do not exist. What was unnoticed previously can become a desirable objective after such deliberative process, resulting in an intention of behaviour that could become antisocial or delinquent behaviour when a suitable opportunity is detected, after a risk vs. benefit evaluation (Rational Choice approach).

Therefore, the reviewed variables can be seen as a process with several stages where the reviewed theoretical proposals are not only compatible; they need to be integrated in a common frame in order to fully understand and/or influence behaviours. This reflection has a certain relevance from the theoretical point of view, but also in terms of applicability, since situational measures will not only transform physical spaces, because the situation is more that the purely spatial dimensions of the place.

Thus, we would like to highlight that the possible success in understanding this process will not depend on what we can learn from the individual, social or environmental level variables, in an isolate way. We believe that the answers will be necessarily complex and their quality will depend on how we are able to articulate the interaction among the three levels

for each crime type (or antisocial behaviour type) and even for onetime events vs. repeated antisocial event that could led to a criminal career. Considering the rapidly increase of the crime related studies (Canter & Youngs, 2015), we expect the summarised information and the suggestions provided in this paper to help in the following steps of this area of research and intervention

3.
Situational and opportunity factors on juvenile delinquency in the Basque Country

3.1. Introduction

Everyday life routines play an essential role for the offending behaviour, as for any other behaviour (Cornish & Clarke, 1986, 2017). According to Cohen's and Felson's (1979; Felson, 2017) Routine Activity Theory (RAT), there are three necessary elements for a crime to happen: offender, a target, and guardian. Opportunity appears when motivated offenders and possible targets are present at the same time, in a specific setting, and there is a lack of a 'capable guardian', someone or something that could prevent the crime from happening. The non-randomly distributed opportunities would explain, at least in part, the fact that crime shows spatiotemporal patterns, as it has been showed repeatedly (P. J. Brantingham & Brantingham, 1981; P. J. Brantingham, Brantingham, & Andresen, 2017; Menting, 2018).

Specifically for juvenile crime, a large amount of literature has showed the influence of opportunities and the near urban environment for crime (Bichler et al., 2012; Redondo, 2015; Weerman et al., 2015; Wikström, 2006; Wikström

et al., 2012). Juvenile offences are located near the relevant nodes where young people spend most of their time, such as schools, residences, or leisure activity nodes (Johnson & Summers, 2015). Furthermore, risky leisure activities, understood as unsupervised activities with peers combined with opportunity to consume alcohol or substances, have been associated to juvenile delinquency (X. A. Gómez-Fraguela & Cutrín Mosteiro, 2014; Weenink, 2011), as well as to juvenile victimisation (Tanner et al., 2015). Looking at the third element of the RAT, the guardianship concept, one way to operationalize it has been to measure collective efficacy (Fox & Bouffard, 2015; Maimon & Browning, 2010, 2012). Higher collective efficacy is expected to be related to a higher level of informal social control, thus implying a greater probability for a guardian to act.

Empirical research from this perspective, has been mainly developed in a concrete set of physical and cultural settings, mainly in Belgium, Germany, the Netherlands, North of America and United Kingdom (Medina, 2011a; L. J. R. Pauwels, Bruinsma, et al., 2018); and, therefore, it would be advisable to replicate these findings or identify specificities that could arise in different settings, as it will be explained below. The present study aims to better understand the influence that opportunities for crime have on juvenile delinquency in a Southern European context. Specifically, we analyse the role of risky leisure opportunities, non-risky leisure opportunities, residential instability, population size, and single parent families, using a count model with a sample composed by 1,920 crime events committed by juvenile between 12 and 18 years old in 251 municipalities in the Basque Country, a region of the north of Spain.

3.1.1. Theoretical background

3.1.1.1. Opportunities for leisure and lack of informal control

As proposed by the RAT, delinquency happens when offenders and victims converge in one place in the absence of a capable guardian (Cohen & Felson, 1979; Felson, 2017). Therefore, risky leisure places contain the necessary ingredients for juvenile delinquency to happen. Theoretical and empirical reasons support that leisure routines have a direct relationship with juvenile delinquency (Tanner et al., 2015). The risk variables involved in the juveniles' leisure routines -unstructured activities with peers, use of alcohol and substances, presence of antisocial peers- are the main reasons behind this association and have been found to be robust predictors of juvenile delinquency (Amemiya et al., 2017; Averdijk & Bernasco, 2015; Pooley & Ferguson, 2017; Svensson & Pauwels, 2010). Hanging out with friends far from the eyes of a handler adult is a common risky activity among youths. When this happens at certain places, such as bars, clubs or pubs, the chance to offend will be increased. First, because there is a risk of alcohol and/or substance consumption that may act as situational precipitator (Campoy-Torrente & Summers, 2015; R. Wortley, 2017), and second, because suitable targets are present.

As Felson (2017) suggests, the daily routine activities of the people shape the criminal actions. Settings that attract a great amount of people without a criminal purpose play a crime generator role (P. J. Brantingham & Brantingham, 1981; P. J. Brantingham et al., 2017). In this sense, research have also shown that places where people enjoy their leisure time, such as restaurants or cafeterias, are related to juvenile delinquency (Weisburd et al., 2009). An explanation to this might be that those places conform part of the activity space of juveniles (Bernasco, 2019). Those settings also create the perfect scenario attracting suitable targets and potential offenders, and therefore providing the right crime opportunity.

The amount of people living in an area increases the likelihood of crime opportunities (Ackerman & Rossmo, 2015). However, there is also theoretical and empirical support for the opposite idea: a setting with high population density can deter delinquents if their perception of being monitored is high. According to the RAT, higher density could imply a higher level of guardianship, but it is also known that opportunities for each crime type are specific, and population density could affect crime types in a different way. Vandalism or violent offenses might be committed in places with less witness or possible guardians (Baudains, Braithwaite, & Johnson, 2013). Property crimes, on the contrary, could benefit of the higher presence of people in places such as commercial or leisure areas, in order to find suitable targets and leave the place quickly without being noticed. For some offences, juveniles will choose the optimal area for committing a crime, leaving few things to chance; for others, places or situations with precipitators will be the most relevant factor, such as violent incidents while hanging out around pubs having consumed alcohol or other substances (Campoy-Torrente & Summers, 2015; R. (Richard K. . Wortley & Townsley, 2017).

Looking at the guardianship concept, scholars have found that the higher the level of collective efficacy in an area, the lower the juvenile delinquency rate. Specially, the violent delinquency rate (Maimon & Browning, 2010, 2012). Collective efficacy has been understood as social cohesion with the intention to act for the common good (Sampson et al., 1997), and can be seen as a form of informal social control, therefore playing a role in the guardianship dynamics. The opposite situation would happen in an area with high levels of population mobility, a variable negatively associated to social cohesion and informal social control that has been related to delinquency (Johnson & Summers, 2015). Residential stability is essential to build trustworthy relationships among neighbours and, therefore, to increase the levels of social cohesion. The proportion of rented households has been considered as an indicator of

residential instability (Mennins & Harris, 2013). In the studied context, Spain, renting a house implies a temporary situation, which can affect to the level of implication that the tenant has in the neighbourhood and, in consequence, a high number of tenants may affect the social cohesion of an area.

Literature has also shown that areas with greater ethnic heterogeneity are most likely to be chosen to offend (Baudains et al., 2013; Bernasco, Johnson, & Ruiter, 2015; Bernasco & Nieuwbeerta, 2005). It has been argued that ethnic diversity decreases the level of social cohesion, but according to the latest report of the Migration Observatory at the University of Oxford (Demireva, 2017) this is found in North of America while the evidence in Europe is mixed. Ethnic diversity and social cohesion could have a negative association if ethnic heterogeneity increased the anomie feelings, thus affecting the social cohesion (Van Der Meer & Tolsma, 2014). This would happen when the goal of an in-group is to keep their own identity, and any external element, as the presence of an outgroup, may be a threat. However, in certain communities ethnic heterogeneity could be understood as a positive element offering social and cultural enrichment opportunities, a perspective that goes along the lines with the idea proposed by Fischer (1976) that urban heterogeneity offers better adaption options in a changing world, as it happens with biodiversity in natural habitats. When this is the view shared by the community, it would not be an obstacle for social cohesion; it could even be a positive factor.

Empirical research in different countries have shown that areas with greater single-parent families there are related to delinquency (Bernasco & Nieuwbeerta, 2005; Wong, 2017). It has been suggested that areas with more percentage of single-parents might have less level of surveillance (Bernasco & Nieuwbeerta, 2005), since household must be emptier for longer period of time.

Putting everything together, we could argue that leisure opportunities and poorer social control would increase the opportunity to offend. Juveniles

will likely target areas where they hang out in, such as streets with pubs and bars or places with restaurants and cafes, knowing that a greater number of possible targets might be there. Moreover, areas with residential instability and a higher percentage of single-parent families could have a lower level of social cohesion and be less monitored by capable guardians, therefore becoming more attractive for potential young delinquents.

3.1.1.2. Cultural differences

As previously said, the vast majority of the research on criminology comes from an Anglo-Saxon background. Core countries, such as US and UK, have lead the research in this field, as well as in many other fields for many decades (Heine, 2010; Medina, 2011a). The universalization of some theories, such the RAT, also leads to the globalization of some key variables or concepts without taking into account the differences from each individual culture. Among others, one of the greatest risk of ethnocentrism is to transfer the same variables used in a specific context to other settings (Medina, 2011a). We must be aware that, despite the globalization, there are cultural differences that might affect the universal causes of the delinquency claimed by the situational and opportunity theories (Karstedt, 2001). The human being relies on the cultural context where his/hers values, strategies or ideas have been shaped (Heine, 2010). Therefore, researchers from the "periphery" countries must take into account the particularities that their context might bring in the explanation of the criminal behaviour (Medina, 2011a).

Historical backgrounds have shaped some notorious differences among Southern European countries, when comparing with Northern and Western European countries and Northern American countries. For instance, in traditionally Catholics countries –most of the Southern Europe and Latin America- extended family have played a relevant role for childcare and support. Meanwhile, in countries with a Protestant tradition the nuclear family –parents

and children- has the main role leaving extended family aside (Junger-Tas, 2012). Regarding the leisure time, adolescent that are more "peer-centred" have higher risk of being involve in delinquency than those that are "family-centred" (Steketee, 2012). That makes sense since spending time with family provides a kind of controlled leisure time. In contrasts, leisure time with peers often means to hang out in public places without supervision, and without a specific aim, which has been considered a robust predictor of youth delinquency (Hoeben & Weerman, 2016; Maimon & Browning, 2010; Osgood & Anderson, 2004). In this context, adolescents from Mediterranean European and Latin American countries are more "family-centred"; youth from Anglo-Saxon countries, however, have been shown to be more "peer-centred" (Steketee, 2012). Those differences are important since this can influence in the type of leisure activities that youth take part.

Relevant routines that could affect juvenile delinquency can also be found at the national or regional level. For instance, Spain is a country that has traditionally connected the leisure with alcohol consumption; thus, it is not surprising that youth replicate the leisure patterns that have seen from their parents (Cortés Tomás, Espejo Tort, & Giménez Costa, 2008). In Spain, the entrance in nightclubs and discos is forbidden for underage people except if those are accompanied by an adult[3]. However, underage checkouts are often not guaranteed (Calafat, Duch, Juan, & Leckenby, 2012). Alcohol consumption is regulated by the Spanish law forbidding locals and stores its sell to underage people. Nevertheless, in Spain there is a phenomenon called "*botellón"* where adolescents gather together in public spaces having as main objective to consume high quantities of alcohol and to socialise with other youth groups (Cortés Tomás et al., 2008). The principal reasons to participate in the "*botellón*" are: to have fun, the pressure of the group to drink alcohol, and the

[3] Spanish law for the prevention of alcohol consumption by underage people: "Ley 11/2010, art. 16".

price of the alcoholic drinks in the night leisure locals (Cortés Tomás et al., 2008; Galán & Burguillo, 2008; Pedrero-García, 2018). The "*botellón"* is a phenomenon that required specific attention since it contains a great amount of situational risks that contribute to the juvenile delinquency: alcohol and drug consumption, peers, or the competition for some products –for a taxi or a drink (Lucía Summers, 2009).

Working time schedule can be another example of routine differences between Spain and other European countries. In Spain, the majority of the people work in split-shifts, working nonstandard work hours -earlier than 9 pm and later than 5 pm-, a fact negatively related to parent-child time (Gracia & Kalmijn, 2016); affecting the time that parents parent spend with their children, which has been demonstrated to be a strong protective factor in juvenile delinquency (Steketee, 2012).

In sum, in order to claim the opportunity theories as universal it is noteworthy the need of replication in different contexts, as well as the detection of the specificities that could shape the relation between certain opportunity and environment variables and juvenile crime in different cultural and geographical contexts.

3.1.2. The current study

The present study explores the association between some key variables related to situational risk factors and the location of juvenile offences, using data provided by the Basque Police. Particularly, we assess the influence of crime opportunities (operationalized as *risky leisure opportunity* –pubs, nightclubs and bars-, *non-risky leisure opportunity* -the rest of hostelry establishment: restaurants, cafes, hotel, etc-, and the *population size*) and the lack of informal control (*residential instability* and *single parents* that would affect cohesion and social control) on juvenile delinquency.

Based on the existing literature, we expect that leisure establishments will maximise the chance of suitable targets, therefore we hypothesize that they will increase the probability of juvenile delinquency in general. In the same way, we expect that the municipalities with higher population will be related to juvenile delinquency.

Finally, we expect that those municipalities with higher residential instability, that hinders social cohesion, and higher percentage of single-parent families will be positively associated with juvenile incident rates, due to the reduced presence of guardians.

3.2. DATA AND METHOD

3.2.1. Study area

The unit of analysis was the municipality. Therefore, the sample was composed of 251 municipalities of the Basque Country, a region located at the North of Spain. With a total population slightly over 2,000,000 citizens and a juvenile population around 131,120 people between 12 and 18 years old, the Basque Country has three main cities –Vitoria-Gasteiz, Bilbao, and Donostia-San Sebastián, with a population between 180,000 and 350,000 residents. Moreover, 39 of the remaining municipalities have a population between 10,000 and 100,000 inhabitants and finally, 209 towns count less than 9,999 residents.

3.2.2. Measures

3.2.2.1. Outcome variable

The outcome variable for the present study is the juvenile delinquency rate – total incidents divided by the juvenile population (juveniles between 12 and 18 years old). The number of *incidents* committed by juveniles between 12 and 18 years old, for the period of 2010 to 2015 in the Basque Country, Spain, is provided by the Basque Police –*Ertzaintza*-. For the studied period, a total of

2,169 offenses were recorded. We had to dismiss 11.5% of the cases due to lack of information about the place where the event happened. As a result, the sample was composed by 1,920 criminal offenses committed by juveniles between 12 and 18 years old. Table 3.1 offers the descriptive statistics, where the range of the juveniles' incidents per municipality goes from 0 to 327.

3.2.2.2. Predictor variables

The predictor variables were based on the 2011 census data of the National Statistics Institute of Spain[4] (INE, "*Instituto Nacional de Estadística*"), the information gathered from the Basque Statistic Institute[5] (Eustat) and the shapefile downloaded from Geofabrik[6]. Since official data did not provide an accurate counting of the number of pubs, bars, and discos (*risky leisure opportunity*), and restaurants, cafes, hotels, etc. (*non-risky leisure opportunity*) separately for each municipality, we used the data from Open Street Map (OSM) provided by a shapefile from Geofabrik -as previous evidence has done (Malleson & Andresen, 2016)-. We also constructed a scale to measure *residential instability* –that can hinder social cohesion-. After computing the necessary analysis (Bartlett's test and Kaiser- Meyer-Olkin test) that legitimate the use of principal components analysis (PCA), the result we extracted a factor with eigenvalue higher than 1.34. The factor, *residential instability*, gathered a) percentage of foreign people, b) percentage of tenants, and c) population churn (following the work by Baudains, Braithwaite, and Johnson, 2013, and Dennet and Stillwell, 2008). The percentage of *single parents* –single-parents with children under their economic protection- and the *population size* was based on the data provided by the INE. We log transformed the *risky leisure opportunity,*

[4] https://www.ine.es/censos2011_datos/cen11_datos_inicio.html
[5] http://en.eustat.eus/bancopx/english/indice.html
[6] https://www.geofabrik.de/data/download.html

non-risky leisure opportunity, and the *population size* in order to reduce the skewness.

3.2.3. Analytical Strategy

In order to test our hypothesis, we run an adjusted negative binomial regression analysis with juvenile delinquency rate as the outcome variable and the previously described situational and opportunity variables as predictors. Due to the characteristics of our data, the ordinary least squares model (OLS) was not suitable because critical assumptions were violated. Thus, Poisson-based models, as Osgood (2000) suggested, were run. Osgood (2000) demonstrated that spatially aggregated juvenile crime data, usually highly skewed and over-dispersed, have a better fit in a Poisson-based negative binomial regression than in an OLS analysis. To do so, the count model must be altered to run the analysis of the juvenile delinquency rates (details can be found in Osgood, 2000).

The likelihood-ratio test confirmed that alpha was not equal to zero (e.g. LR = 281.401; $p < .001$) and therefore the adjusted negative binomial regression was run, instead of a Poisson regression. Moreover, we calculate the models using robust standard errors to address over-dispersion. Finally, the *variance inflation factor* (VIF) was calculated for models to evaluate the risk of multicollinearity, showing values within acceptable levels (Bowerman & O'Connell, 1990).

3.3. RESULTS

3.3.1. Descriptive and crime rates

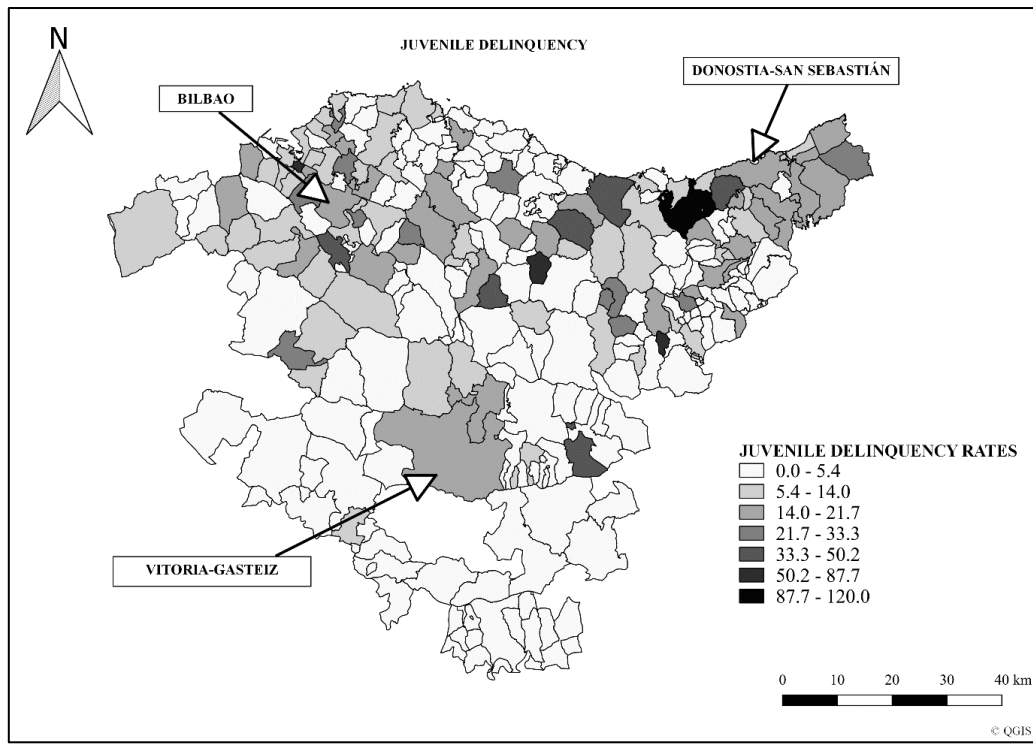
Table 3.1 shows the results of the descriptive analyses, and figure 3.1 offers a map of the municipalities of the Basque Country showing the juvenile delinquency rate per 1,000 inhabitants. The main cities of each region -Bilbao, Donostia-San Sebastian, and Vitoria-Gasteiz- did not have the highest rate of

juvenile delinquency, and the municipalities around them are the cities that show the highest incident rates. However, this map must be cautiously interpreted since the rates have been calculated using the population between 12 and 18 years old. Most of the municipalities showing low incident rates are rural areas.

Table 3.1. Descriptive statistics of the variables.

Variables	Min.	Max.	Mean	SD
Juvenile delinquency rate per 1,000	0	120	8.47	14.80
Total Incident counts	0	317	7.65	30.91
Violent Incident counts	0	157	4	14.76
Property Incident counts	0	160	3.65	17.16
Risky leisure opportunity (Pubs/ bars/ nightclubs) (log)	0	6.23	1.04	1.29
Non-risky leisure opportunity (Restaurants/Cafeteria/Hotels …) (log)	0	6.77	1.24	1.27
Population size (log)	4.74	12.77	7.52	1.61
Residential instability	-3.11	4.71	0	1
% Single Parents	0	18.49	9.86	2.57
N of municipalities		251		

Figure 3.1. Map[7] of juvenile delinquency rates in the Basque Country (Spain).



3.3.2. Estimated models

The first model shows the relationship between the variables of the crime opportunities and the lack of informal control and general juvenile delinquency. The second depicts the effect of crime opportunities and lack informal control on violent juvenile delinquency. Finally, the third and last model shows the association between crime opportunities and the lack informal control on property juvenile delinquency. The results in the table 3.2 are presented in terms

[7] Contains information from the Ertzaintza and Open Data Euskadi: http://opendata.euskadi.eus/catalogo-datos/

of the regression coefficient; the signification of the regression coefficients (*b*) was tested by a Z-test. However, the asterisk indicates the significance due to space limitation. Additionally, figure 3.2 depicts the incident-rate ratios (IRRs) of the first model as a relative measure of the effect to assist interpretation (Tripepi, Jager, Dekker, Wanner, & Zoccali, 2007; Vogel & South, 2016).

Table 3.2 shows the outcomes of the negative binomial regression analysis. First, in the model 1 we estimated the relationship between the *risky leisure opportunity*, *non-risky leisure opportunity*, *population size*, *residential instability* and *single-parent families* with the general juvenile delinquency rates. Our results partially confirm our hypothesis. On the one hand, the results showed that the variable *risky leisure opportunity* (IRR=0.82; $p > .05$) has a non-significant association with juvenile's general incident rates. On the other, *non-risky leisure opportunity* depicts a strong positive relationship with juvenile delinquency (IRR= 1.31; $p < .05$). Moreover, *population size* has also a positive effect on juvenile delinquency (IRR = 1.23; $p < .05$). Finally, contrary to our hypothesis, *residential instability* (IRR = 0.99; $p > .05$) and *single-parents* (IRR = 0.99; $p > .05$) were not associated with juvenile incident's rates.

Table 3.2. Estimated adjusted negative binomial regression models of juvenile delinquency.

	Model 1		Model 2		Model 3	
	b	(SE)	*b*	(SE)	*b*	(SE)
Intercept	-6.31***	(.797)	-6.111***	(.905)	-7.990***	(1.139)
Opportunity						
Risky leisure opportunity (log)	-.193+	(.101)	-.203+	(.115)	-.124	(.135)
Non-Risky Leisure Opportunity (log)	.271*	(.110)	.298*	(.126)	.178	(.149)
Population size (log)	.209*	(.083)	.141	(.094)	.259*	(.114)
Lack of Informal Control						
Residential Instability	-.008	(.086)	.007	(.097)	-.092	(.119)
Single Parents	-.014	(.044)	-.033	(.052)	.031	(.068)
N	251		251		251	
df	245		245		245	
Deviance	202.97		191.49		163.01	
Log-likelihood	-381.919		-312.557		-227.979	
AIC	777.84		639.11		569.96	

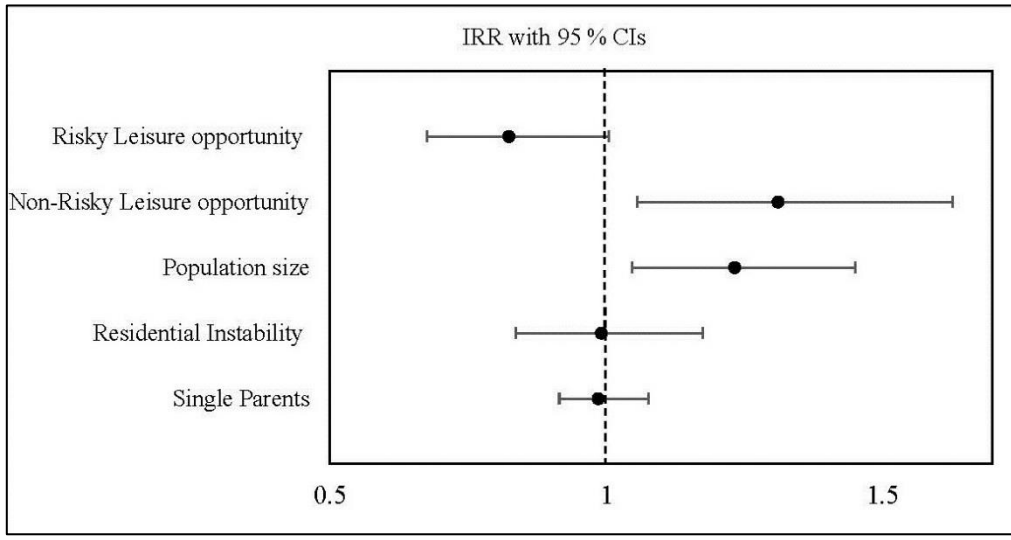
$^{+}$ p < 0.10; * p < 0.05; ** p < 0.01; *** p < 0.001

Model 2, as mentioned, presents the association between the variables of crime opportunity and the lack informal control and juveniles' violent incident rates. In this model, just *non-risky opportunity* seems to be associated with violent events showing a strong positive effect (IRR= 1.34; p <.05). The rest of the variables showed a non-statistical association with violent incidents committed by juveniles.

Finally, model 3 shows the association between the mentioned variables and juvenile's property incident rates. The model outlines that *population size* is the unique variable that seems to be related to property incidents. The results show that municipalities with higher population present higher property event rates committed by juveniles (IRR= 1.29; p < .05).

It is noteworthy that the three models fit well to the data, as the goodness-of-fit test displays (e.g. GOF X^2 = 205.31; df = 246; p > 0.05) (Hilbe, 2011). The AIC parameter did not indicate that the addition of variables penalised the models' goodness-of-fit.

Figure 3.2. A forest-plot of with the IRR of the model 1-general juvenile delinquency-.



3.3.3. Sensitivity analysis

In order to test the robustness of our results, we run sensitivity analysis. Based on the spatial condition of our variables, we run a spatial models including spatial lag variable of the juvenile events counts, as previous research has done (Boivin & Felson, 2018; Lucia Summers & Johnson, 2016). The result did not show many differences when comparing with the aspatial model; *risky leisure opportunity* showed a significant result. However, we run the test to check the spatial autocorrelation of the residuals of the aspatial model (Lin & Zhang, 2007) and those did not show any spatial autocorrelation. Therefore, our results of the aspatial models are not under or overestimated.

3.4. DISCUSSION

According to the situational perspectives, everyday life routines influence juvenile delinquency. Literature has shown that ordinary activities or lack of social control such as risky leisure activities or residential instability increase the opportunity to be involved in delinquency. However, routines or social structure, among other factors, can differ according to the cultural and social context, and as a result, the way those variables are related to juvenile offenses

can be different. Therefore, the aim of the present study was to explore and go deeper into the effect of some situational and opportunity risks on juvenile delinquency in a southern European region. To do so, we used police data on juveniles' incident rates as a proxy of juvenile delinquency to measure our outcome variable and data from the Spanish and Basque Statistical Institutes and Open Street Maps to conform our predictor variables.

Using the adjusted negative binomial model, the findings showed that risky leisure opportunities do not depict an association with juvenile delinquency. This finding is opposite to the international evidence (Berg and Loeber, 2011; Bichler, Christie-Merrall, and Sechrest, 2011; Johnson and Summers, 2015; Wikström, Mann, and Hardie, 2018). We also expected a positive relation with delinquency rates for non-risky leisure establishment and population size and our results confirm this hypothesis: municipalities with more hostelry establishments and population do have higher rates of general juvenile delinquency. Those findings are in line with previous ones in other contexts (Bernasco, 2019; Weisburd et al., 2009). Additionally, we hypothesized a positive association of residential instability and single-parent family with juvenile delinquency, but this was not confirmed by out results.

A number of reasons can explain our findings. Firstly, the greater effect of non-risky leisure establishments identifies this variable as the most relevant predictor of juvenile delinquency, among the studies ones. As the literature points out, leisure places have been considered crime generators and attractors for youths (Bichler, Christie-Merrall, and Sechrest, 2011; Johnson and Summers, 2015). The same effect has been found for other facilities where youth should engage in prosocial activities, such as sport centres, libraries, or schools (Johnson & Summers, 2015; Osborne et al., 2016). Facilities such as restaurants, cafeterias or hotels, are available across all geography, but those are also more concentrated in metropolitan urban areas. Previous evidence has found that

areas with catering business are chosen by juveniles to offend (Bernasco, 2019; Weisburd et al., 2009). Those amenities are often concentrated at the city centres as much as the juvenile delinquency is, as previous research in our context has showed (Trinidad, San-Juan, & Vozmediano, 2019; Vázquez, Férnadez-Molina, et al., 2014). From a theoretical point of view, we could infer that those places are part of the routine activities of the juveniles (Felson, 2017), and that therefore, those settings belong to their activity spaces and awareness space –conformed while going to school or hanging out with friends- (P. J. Brantingham et al., 2017). This thesis has been repeatedly empirically supported in other contexts (Bichler et al., 2014; Wikström, Ceccato, et al., 2010).

Our findings also showed that population have a positive relation to juvenile delinquency as previous research has demonstrated (Ackerman & Rossmo, 2015; Boivin, 2018). Over the last years, the amount of people living in an area has been considered as a bifunctional variable according to the Routine Activity Theory. On the one hand, it has been interpreted in terms of opportunity (Ackerman & Rossmo, 2015; Boivin, 2018); assuming that places with higher population offer a greater chance to find likely victims; that would be for our case, as higher population size have been associated with property and general juvenile delinquency. On the other hand, scholars have also suggested that places with higher population levels of the guardianship is increased; especially for those areas where people go to study, to shop or to work (Boivin, 2018). However, it can be an interesting exercise to recall some classical theses on population. This variable has been correlated with social problems such as delinquency and mental pathologies (Galle, Gove, & McPherson, 1972) but it loses its effect -or it becomes weaker- when complex analysis are run (Hombrados Mendieta & Gómez Jacinto, 1993). Classical urban thinking also describes how in high population situations, the perception threshold changes due to the high amount of stimulus. Simmel (1950) and Milgram (1970) used the concept of ‘overload’ to explain how individuals react to a urban

environment that offers a much greater amount of stimulus than a rural or natural environment. We adapt to the overloaded environments by not paying attention to unnecessary stimulus and focusing on what is essential for us. Hence, in situations with a greater ambient population, potential guardians could lose their attention, making them unable to deter a possible offence.

Not finding a significant association between risky leisure establishments and juvenile delinquency is contrary to our initial expectations. However, this finding might be explained by the type of risky leisure in which juveniles usually take part in our context. The so called "*botellón"*, a binge alcohol consumption in a youth crowed public or private spaces (Pedrero-García, 2018). The *botellón* plays an essential role for the youngest, as they have more restrictions than the juveniles over 18 years old. For instance, limited access to pubs or discos or the limits on the time spent outdoors -imposed by parents-. Thus, the *botellón* will be the principal attraction for the night leisure of the adolescents, and they will consume the previously purchased alcohol in some public space locations or in private spaces, doing so in a short space of time since they are not allowed to return home as late as older young people (Gómez-Fraguela & Cutrín Mosteiro, 2014). A major risk of this type of leisure is that, while in bars, pubs or discos exist a kind of control –bar tenders or private security- over drugs consumption or antisocial behaviour, in the settings of the *botellón* those controls disappear (Gómez-Fraguela, Fernández Pérez, Romero Tríñanes, & Martín, 2008; Gómez-Fraguela & Cutrín Mosteiro, 2014). Considering our results, we must say that further research is needed in order to identify the places where juveniles carry out this risky leisure activity and, to go deeper into its association with juvenile delinquency.

Finally, our variables measuring the lack of informal control did not show any association with juvenile delinquency. One possible explanation is that the variables traditionally used to measure poor social cohesion and the lack of

social control (Sampson et al., 1997) do not work in our context to reduce the delinquency. For example, research conducted in Spain has shown that immigration does not reduce the community trust (Echazarra & Morales, 2012; Morales & Echazarra, 2013). This is quite remarkable considering the migrant phenomenon lived between 2000-2008; an accelerated increment of diversity (Echazarra & Morales, 2012). Such a rapid change has been related to the loss of trust in the community and consequently affecting the social cohesion. However, as said before, it seems not to be the case for Spain (Echazarra & Morales, 2012; Morales & Echazarra, 2013). Immigration has shown positive association when measuring crime perception in Spain, but surprisingly in a city of the Basque Country (Bilbao) the relation was strongly negative (Echazarra, 2014).

Similarly, and according to international literature, there is evidence on single-parent families being a criminogenic variable that predicts juvenile delinquency (Erdelja et al., 2013; Ikäheimo, Laukkanen, Hakko, & Räsänen, 2013; Wong, 2017), but this is no supported by our findings. Perhaps single-parent families are not necessarily in a disadvantage situation, as some authors have contemplated (i.e. Sampson, Raudenbush, and Earls, 1997); or represent a lack of social control, as suggested by others (i.e. Wong, 2017), since in Spain, a single-parent family is not necessarily a family without social support. If something characterises societies of southern Europe is the strong family system (Reher, 2004); the family welfare system in Spain –as well as other Southern European countries (Ferrera, 1996)- assigns to the family a core role, who will be the source of well-being and welfare of its members (Moreno, 2001). Thus, the family system in Spain will not just provide the necessary material and emotional support, but an essential informal control that will help to prevent delinquency in general (Cid & Martí, 2016) and, in particular, juvenile delinquency (Fernández-Molina & Bartolomé Gutiérrez, 2018).

Moreover, after the economic crisis, in Spain many social programs –at municipal, regional, and state level- supporting families, children and youths suffered the expenditure cuts (Moreno, Del Pino, Marí-Klose, & Moreno-Fuentes, 2014; Planas-Lladó, Soler-Masó, & Feixa-Pàmpols, 2014), which have definitely affected to the groups in risk. As some authors suggest, this had implications on juvenile delinquency, showing that in a context where juvenile delinquency drops, offenses of youth from more disadvantages families has increased (Fernández-Molina & Bartolomé Gutiérrez, 2018). In this context, our findings could be explained by the protective role of the family combined with a strong institutional support system. The expenditure of the Basque Country government in social services is higher than other regions in Spain (Herrero-Alcalde & Tránchez-Martín, 2017; Peña-Longobardo, Oliva-Moreno, García-Armesto, & Hernández-Quevedo, 2016); therefore providing higher levels of social protection, in a country and culture where social protection is generally high.

We should acknowledge some limitations of the present work, that also help suggesting avenues for future research. In relation to our outcome variable, police data was exclusively used. Even though police records are trustworthy, there is a considerable amount of non-reported juvenile delinquency (Bernasco, 2019). Therefore, the literature has enhanced the value of the delinquency self-reported surveys. Future studies should consider complementing police records with surveys. More, we operationalized our predictor variables using official statistical data. In future research, this source of information could be combined with others, such as an observational analysis of the places where the incidents happened. More, we are also aware that our data of juvenile delinquency come from a 6-year period of time and that the predictor variables are taken from a single year. However, and taking that as a possible bias of our results, we chose those predictors that vary less across time and those that were essential for our study. Finally, we used aggregate data for the municipalities, since this was the

unit of analysis available for this study; we plan to continue this research line using smaller units of analysis that could offer a more detailed image of the variability on juvenile delinquency.

Despite the mentioned limitations, and not falling into the possible ecological fallacies, we believe that this work has contributed to better understand juvenile delinquency in a southern European context. It is noteworthy the effect that non-risky leisure opportunities have on juvenile delinquency. In this sense, we would like to highlight some practical implications for juvenile crime prevention. The role of non-risky leisure facilities should be considered by those municipalities that have more type of these establishments. For example, the owners of non-risky establishments in those municipalities should pay attention to the security issues or, at least, they should be aware of the lack or presence of social informal control. More, local governments of municipalities with more non-risky establishments could also provide more security resources for the owners of those kind of establishments.

As for the lack of effect found for risky leisure facilities, single parent families, and residential instability, these results do not support most evidence from other geographical contexts. This highlights the need for replication in contexts with diverse of social dynamics. Future research will have to confirm if the social welfare system differences between Europe and other contexts are the reason why some social factors predict offenses in some contexts, such as in the US, but have a lower influence on delinquency in European countries; as well as explore the role of other cultural peculiarities. At the end of the day, we know that delinquent behaviour happens in everyday life. We believe that theoretical models are not monolithic neither global, even more when considering situational models or theories such as the Routine Activity Theory. If southern European routines such as dinnertime, leisure activities, or school timetables

differ from other countries, the way situational variables affect juvenile delinquency will differ as well.

4.
La Concentración de la Delincuencia Juvenil en el Espacio

4.1. Introducción

La evidencia empírica ha demostrado la relevancia que el espacio y el ambiente tienen en la explicación de la etiología de la delincuencia. Así, desde la Criminología Ambiental se ha investigado la influencia que la situación inmediata tiene sobre el hecho delictivo (Vozmediano & San Juan, 2010; Wortley & Townsley, 2017). Efectivamente, desde los inicios de esta disciplina con los mapas morales de estadística en Francia de Balbi y Guerry (1829), pasando por los trabajos sobre ecología humana de la Escuela de Chicago (ver más en detalle el trabajo de Shaw & McKay, 1942), hasta llegar a las actuales perspectivas situacionales, tales como las teorías de la elección racional (Cornish & Clarke, 1986), las actividades cotidianas (Cohen & Felson, 1979) y el patrón delictivo (P. J. Brantingham & Brantingham, 1981), las variables contextuales han tenido un peso específico relevante en los modelos explicativos de la conducta delictiva. En este sentido, y siguiendo a Wortley y

Townsley (2017), la Criminología Ambiental y el Análisis del Delito tendría tres proposiciones básicas:

- La influencia del entorno inmediato en el comportamiento delictivo.
- La no distribución aleatoria en espacio y tiempo de los eventos delictivos.
- El conocimiento de los elementos criminogénicos ambientales servirían para investigar, controlar y predecir la delincuencia.

Centrándonos en el fenómeno de la no aleatoriedad del delito, resulta pertinente traer a colación la denominada "ley de Weisburd" (Weisburd, 2015). Dicha ley refiere que la mayoría de eventos delictivos se concentran en algunas calles específicas en virtud del hecho de que existen escenarios urbanos en los que la probabilidad de que se perpetre un delito es significativamente superior al resto de la ciudad. Es evidente que dicho principio no es nuevo dado de que, desde la citada Escuela de Chicago en el ámbito de la sociología urbana, es un fenómeno claramente constatable. La novedad, si acaso, viene dada por el respaldo científico que en los últimos años ha tenido este fenómeno en diferentes latitudes del planeta y para diferentes tipologías delictivas (Telep & Weisburd, 2018). No obstante, aunque en el caso de las personas menores de edad la investigación sobre esta cuestión no ha sido en modo alguno tan extensa (Telep & Weisburd, 2018), los estudios realizados con esta población también indican que las infracciones cometidas se agrupan en lugares muy específicos de la ciudad (Weisburd, Morris & Groff, 2009), sobre todo relacionados con los espacios donde los menores realizan sus actividades rutinarias: colegios, lugares de ocio, etc. Siendo así, y tal como la evidencia empírica ha demostrado en la delincuencia de adultos, existen factores ambientales y situacionales que precisan ser identificados ya que nos pueden ofrecer interesantes claves en materia de prevención de la criminalidad (Bichler, Malm & Enriquez, 2014; Brantingham & Brantingham, 1981; Campoy Torrente & Summers, 2015; Johnson & Summers, 2015).

Aunque en años muy recientes exista un crecimiento ciertamente muy importante de investigaciones que tienen en cuenta la perspectiva ambiental (Bruinsma & Johnson, 2018), es necesario señalar que la mayoría de investigaciones se han realizado en el norte de América, Reino Unido, Holanda, Bélgica, Suecia y Alemania; y que aun siendo contextos occidentales, existen elementos en el diseño y uso del espacio que presentan notables diferencias con países mediterráneos (Kasanko et ál., 2006). Por otro lado, como ya hemos sugerido, son pocos los trabajos que han explorado los aspectos situacionales de la delincuencia juvenil. Este aparente desinterés sin duda está condicionado por las dificultades inherentes a la obtención de datos de menores de edad y la relevancia preponderante otorgada a la delincuencia perpetrada por adultos.

Así las cosas, esta investigación tiene como objetivo explorar la concentración de los eventos delictivos cometidos por personas menores de edad y los elementos espaciales asociados a dichos eventos en Bilbao, la cual podría ejemplificar una ciudad de tamaño medio del sur de Europa.

4.1.1. Antecedentes teóricos e hipótesis

4.1.1.1. La concentración en el espacio de conductas disruptivas

Estudios longitudinales realizados en América, Europa y Oriente Próximo a lo largo de las tres últimas décadas han demostrado que la concentración de la delincuencia en unos pocos espacios de la ciudad es un fenómeno que se mantiene estable en el tiempo (De Melo, Matias & Andresen, 2015; Sherman, Gartin & Buerger, 1989; Steenbeek & Weisburd, 2016; Weisburd & Amram, 2014; Weisburd, Bushway, Lum & Yang, 2004). Investigaciones como la anteriormente citada de Weisburd et ál. (2004) con una de las mayores bases de datos en la que analizaban los delitos ocurridos en Seattle en un periodo de 14 años (1989-2002) hallaron que el 50% de los mismos ocurrían entre el 4-5% de los segmentos de calles (de intersección a intersección). Estas proporciones, no obstante, pueden variar entre países.

Por ejemplo, en un estudio realizado en Brasil se encontró una mayor concentración de los eventos delictivos en el espacio que en los estudios realizados hasta el momento en Estados Unidos (De Melo et ál., 2015). De la misma manera, Escobar (2012) encontró que la tasa de homicidios también seguía un patrón espacial, concentrándose en ciertos censos urbanos de Bogotá, en Colombia. Más recientemente, Giménez-Santana, Caplan y Drawve (2018) estudiando los espacios peligrosos para la victimización violenta en Bogotá han encontrado que en los lugares con mayor pobreza de Bogotá existe mayor probabilidad de que se cometa un homicidio o un delito violento. En Europa, en cambio, los datos de Steenbeek y Weisburd (2016) mostraron que la concentración era menor que en estudios similares realizados en América; aunque, como podemos comprobar, la ínclita "ley de Weisburd" se sigue cumpliendo.

En lo que respecta a investigaciones realizadas con población juvenil, las investigaciones han encontrado que la delincuencia no solo se concentra en determinadas partes de la ciudad (Barrett, 2017), sino que lo hace de una manera aún más evidente de lo que ocurre con la delincuencia perpetrada por personas adultas. Weisburd, Morris y Groff (2009) hallaron que el 1% de los segmentos de calles de Seattle agrupaban el 50% de las infracciones juveniles. En referencia al tipo de lugar en el que se concentraban las infracciones, Drawve, Walkery Felson (2015) encontraron que los *hotspots* de delincuencia juvenil se agrupaban en lugares como colegios, restaurantes, gasolineras, tiendas de ropa y centros comerciales. Lugares que, coincidiendo con la propuesta de Cohen y Felson (1979), señalarían los espacios en los que las personas menores de edad desarrollan sus principales actividades rutinarias.

En lo que al espacio se refiere, aquellos nodos (lugares relevantes de referencia) donde las personas menores de edad pasan mayor tiempo desarrollando sus actividades cotidianas, así como las rutas que comunican los mismos, conformarían su mapa cognitivo, y en consecuencia serán, con mayor

probabilidad, aquellos lugares donde delinquen (Brantingham & Brantingham, 1981; Brantingham, Brantingham & Andresen, 2017). De esta manera, la investigación ha demostrado que, paradójicamente, la presencia de lugares prosociales –colegios, bibliotecas, instalaciones deportivas, etc.–, incrementan las probabilidades de que ocurra una infracción cometida por menores de edad (Boivin & D'Elia, 2017; Johnson & Summers, 2015). En particular, Osborne et ál. (2016) encontraron una asociación significativa entre la presencia de lugares prosociales y comportamientos transgresores. La naturaleza del espacio también ha mostrado ser relevante en lo que concierne a las infracciones cometidas (Averdijk & Bernasco, 2015; Hoeben & Weerman, 2014). Hoeben y Weerman (2014), por ejemplo, encontraron que la socialización desestructurada en espacios públicos y semipúblicos constituye un mayor factor de riesgo que la que se puede dar en un contexto privado. Por otro lado, y como es de esperar, los lugares donde existe ocio de riesgo, ya sea por el tipo de actividades que se esté realizando (por ejemplo, consumo de alcohol o sustancias) o por la hora en la que ocurra (por ejemplo, ocio nocturno), han mostrado su relación con conducta disruptivas en menores (Miller, 2013; Tanner, Asbridge & Wortley, 2015).

Teniendo todo lo anterior en cuenta, en primer lugar, esperamos que los eventos delictivos perpetrados por personas menores de edad se concentren en zonas específicas de la ciudad. Además, esperamos que en los clústeres de infracciones contra la propiedad exista un mayor porcentaje de instalaciones comerciales, turísticas, aparcamientos y lugares de ocio estructurado y actividad cultural. Mientras que en los clústeres de infracciones violentas, esperamos que las instalaciones predominantes sean los colegios y/u otros centros educativos, restaurantes (especialmente aquellos que puedan atraer a personas jóvenes por el bajo coste de sus productos) y lugares de ocio nocturno (Caplan, 2011; Demeau & Parent, 2018; Giménez-Santana et ál., 2018).

4.2. Método

El presente estudio tiene como objetivo principal conocer las zonas donde existe una mayor concentración de infracciones contra la propiedad y contra las personas. Además, como objetivos secundarios pretendemos identificar las instalaciones y servicios que actúan como generadores de crimen, entendiéndose como espacios que tienen como característica primaria atraer a un número elevado de personas sin ninguna motivación delictiva (Brantingham et ál., 2017) y que se encuentran en los lugares anteriormente detallados. De la misma manera, examinaremos aquellas localizaciones donde existe una superposición de los clústeres de *hotspots* de infracciones contra la propiedad y de tipo violento.

Con el fin de responder a los objetivos planteados, hemos seguido una metodología ex post facto retrospectiva, teniendo en cuenta que las variables recogidas no son manipulables y que los eventos objeto de estudio ya han ocurrido con anterioridad. Como se expone de manera más detallada en el siguiente apartado, la unidad de análisis de este estudio son las secciones censales de la ciudad, como se ha realizado con anterioridad en otros estudios que han utilizado análisis espaciales (Escobar, 2012; Malleson & Andresen, 2016). La muestra de eventos delictivos de menores fue proporcionada por la policía autónoma del País Vasco y la selección de los eventos determinados se detalla en el siguiente apartado, al igual que la obtención de la información relativa a las variables ambientales y los análisis espaciales llevados a cabo.

Teniendo en cuenta la sensibilidad de los datos –eventos delictivos cometidos por personas menores de edad– cabe decir que el presente estudio cuenta con la evaluación positiva por parte del Comité de Ética para las Investigaciones con Seres Humanos, sus Muestras y sus Datos (CEISH) de la Universidad del País Vasco UPV/EHU.

4.2.1. Diseño y método

4.2.1.1. Unidad de análisis

La unidad de análisis del presente estudio es cada una de las secciones censales de la ciudad de Bilbao (N= 281) en la Comunidad Autónoma del País Vasco (CAPV, España). Bilbao es una ciudad con una población aproximada de 343.234 habitantes, de los cuales 55.286 son menores de 19 años. Diversos autores aseguran que cuanto menor es la unidad de análisis, mayor es la precisión de los resultados (ej. Oberwittler & Wikström, 2009). En este sentido, consideramos que las secciones censales son lo suficientemente pequeñas como para considerarse robustas (Boivin, 2018; Malleson & Andresen, 2016), y lo suficientemente grandes como para captar la influencia de las variables ambientales que condicionan la comisión de un delito. Además, este es el nivel más bajo del que se puede obtener información sociodemográfica oficial como es el total de la población residente en cada unidad censal (Instituto Nacional de Estadística (INE), 2018).

4.2.1.2. Incidentes delictivos

Elaboramos nuestra variable dependiente a partir de los datos que nos facilitó la policía autónoma vasca –Ertzaintza– sobre los incidentes delictivos cometidos por personas menores de edad, en Bilbao, entre 2010 y 2015.

Inicialmente, la muestra total estaba compuesta por 351 eventos en los que, al menos una persona implicada en el incidente, era menor de edad. De los mismos, se eliminaron aquellos que ocurrieron en algún domicilio y que estaban clasificados como violencia de género y/o doméstica (N= 79), ya que no se disponía de la dirección en virtud de la ley de protección de datos y que, en todo caso, nuestro mayor interés ahora está focalizado en el espacio público urbano. Además, se eliminaron otros eventos de los que fue imposible obtener la geolocalización exacta (N= 138). Así, la muestra total de incidentes está compuesta finalmente por 134 infracciones.

Los datos fueron agregados temporalmente con el objetivo de aportar mayor robustez a nuestros análisis, ya que de esta forma se consigue mayor estabilidad, sobre todo en delitos poco frecuentes y en unidades de medida pequeñas (Gerstner & Oberwittler, 2011; Messner et ál., 1999), tal y como sucede en nuestro caso, al tratarse de delitos de menores de edad y secciones censales. Una vez geolocalizados los eventos, los agregamos a cada unidad censal y a partir de ahí, elaboramos nuestras variables dependientes, a saber, la tasa por 1.000, tanto de delitos contra la propiedad, como de delitos violentos. Todo ello se elaboró mediante un sistema de información geográfica (SIG) de acceso libre. En la tabla 4.1 se pueden observar los descriptivos de las tasas por naturaleza delictiva, el recuento y la información de la población (censos 2011 del Instituto Nacional de Estadística, INE, 2018).

4.2.1.3. Información ambiental

Las variables ambientales se obtuvieron a partir de la descarga facilitada por *Geografik*[8] de los puntos de interés (PI) identificados por *Open Street Maps* (OSM) y se complementaron con datos obtenidos de *Open Data Euskadi* (2018) en los casos de colegios, bibliotecas e instalaciones deportivas. La clasificación de estas variables se realizó siguiendo a Malleson y Andresen (2016) a partir de la agrupación de los PI que Kinney, Brantingham, Wuschke, Kirk y Brantingham (2008) hicieron. Además, ampliamos la selección incluyendo aquellos grupos y elementos que nos parecían tener relevancia en el contexto del estudio (marcados con un asterisco) y que no contaban con un apartado específico o no estaban incluidos en la clasificación de Kinney et ál. (2008). Los grupos que se formaron fueron los siguientes:

- **Comercios:** droguerías, ultramarinos, tiendas de libros, tiendas de ropa, tiendas de ordenadores, centros comerciales, tiendas de regalos, quioscos, tiendas de móviles, oficinas de correos, joyerías, papelerías,

[8] http://download.geofabrik.de/

tiendas de deportes, supermercados, tiendas de juguetes, maquinas *vending* y videoclubs.

- **Bancos***: bancos y cajeros automáticos
- **Pubs:** bares, pubs y discotecas.
- **Restaurantes de comida rápida:** restaurantes y restaurantes de comida rápida.
- **Turismo*:** Alquiler de bicis, alquiler de vehículos, apartamentos turísticos, hoteles y oficinas de turismo.
- **Parques*:** parques, parques infantiles, lugares para picnic y miradores.
- **Transporte:** estaciones de tren, metro, autobús y taxis.
- **Centros educativos*:** colegios y guarderías, institutos y universidades.
- **Aparcamientos*:** aparcamientos para coches o bicicletas, tanto subterráneos como de superficie.
- **Lugares de ocio y edificios culturales:** lugares arqueológicos, obras de arte, centros religiosos, centros sanitarios, hospitales, centros sociales, bibliotecas, edificios públicos, teatros, castillos, museos, atracciones, centro de arte, cines, prestaciones sociales, ayuntamiento, centros cívicos, piscinas y centro deportivos.

4.2.2. Análisis

4.2.2.1. Hotspots y clústeres

Los *hotspots* se calcularon utilizando la G_i^* de Getis-Ord ya que es un estadístico de autocorrelación espacial local (LISA por sus siglas en inglés) que nos permite diferenciar entre clústeres con puntuaciones altas y bajas, además de calcular si los mismos son estadísticamente significativos (Getis & Ord, 1992; Ord & Getis, 1995). Elegimos el criterio de *reina* de primer orden para calcular la matriz de pesos, tal y como se proponen en investigaciones anteriores de similar naturaleza (Boivin & Felson, 2018). Todo ello se elaboró mediante un

SIG de acceso libre (QGIS Development Team, 2017). Tal y como detallan Malleson y Andresen (2016), este estadístico analiza la relación que existe entre una localización *i* (en nuestro caso las secciones censales) y sus vecinas *j*. Para que se considere un *hotspot* (o *coldspot*), la puntuación de *i* debe ser alta (o baja), e igualmente las de las localizaciones vecinas *j*. Entonces, la suma local y las contiguas se comparan con la suma de las localizaciones a una distancia *d* de *i* previamente establecida. Si la diferencia es mayor de lo que se puede esperar por azar entonces se diría que las secciones *i* y *j* están relacionadas, creándose los clústeres estadísticamente significativos.

4.2.2.2. Buffer

Para explorar las instalaciones y servicios que existen en las áreas de los clústeres denominados como *hotspots*, establecimos un área de influencia de 500 metros sobre cada uno de ellos. Utilizamos esta distancia atendiendo al trabajo citado anteriormente de Malleson y Andresen (2016), ya que, en nuestro contexto, debido a la escasez de estudios sobre la materia, se desconoce cuál sería la dimensión del área de influencia más apropiada. Mediante el SIG realizamos el recuento de las instalaciones y servicios en cada área de influencia para cada clúster *hotspot*.

4.3. Resultados

En términos totales, el 50% de las infracciones registradas en este estudio, cometidas todas ellas por menores de edad, ocurren en el 1,78% de las secciones censales de la ciudad; y el 85% de las infracciones se localizan en un 9,3 % de las secciones censales. En el mapa de calor (ver figura 4.1) se puede observar la concentración de las infracciones en partes muy específicas de la ciudad. De la

misma manera, el mapa de calor de los PI muestra que existe una aglutinación de lugares de interés en la parte más céntrica de la ciudad.

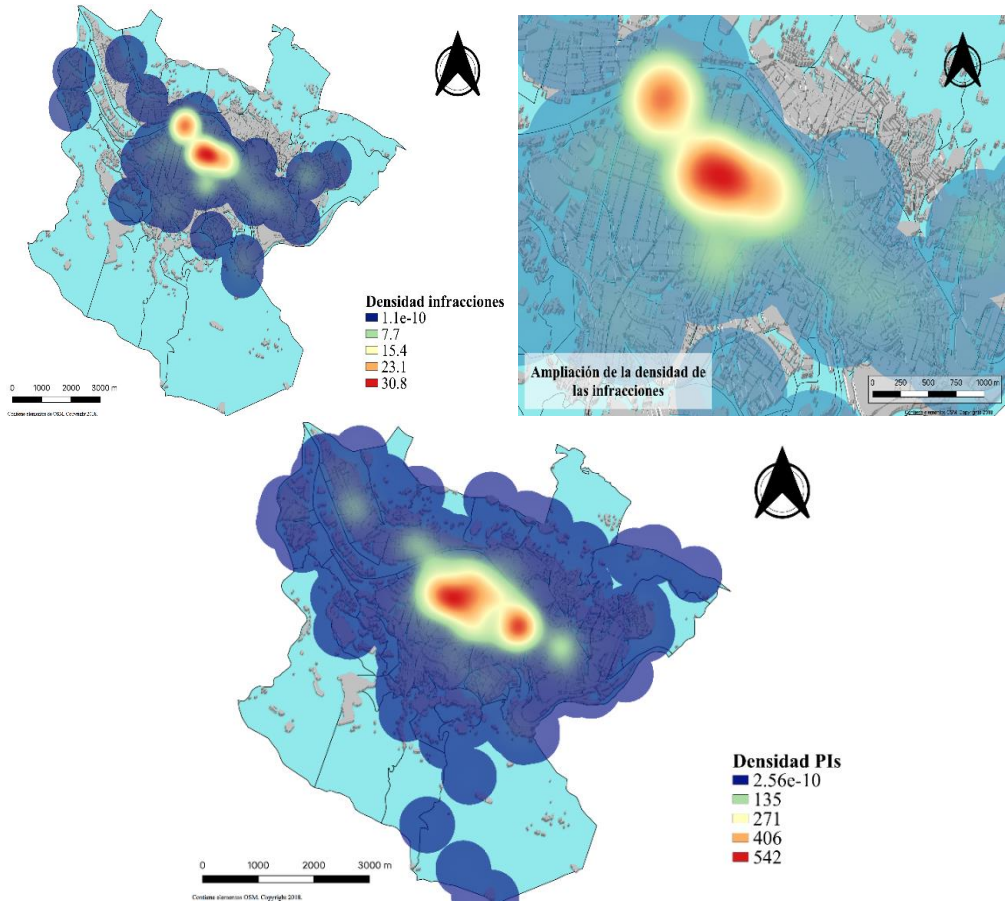


Figura 4.1.Densidad kernel de la delincuencia juvenil y densidad de los puntos de interés[9].

En la tabla 4.1 se muestran los descriptivos relativos a la naturaleza delictiva (contra la propiedad o infracciones violentas) tanto el conteo y tasas por mil como los descriptivos de la población de cada censo. Como suele ser habitual entre los menores, los delitos contra la propiedad constituyen la mayoría de casos, y los incidentes violentos son minoritarios.

Tabla 4.1. Descriptivos de las infracciones

[9] Fuente: Ertzaintza y Open Street Maps. Elaboración propia.

Bilbao	N	Mín.	Máx.	Media	Desv. Típica
Propiedad	91	0	22	0,32	1,855
Propiedad Tasa	86,78	0	20,85	0,31	1,79
Violento	43	0	5	0,15	0,56
Violento Tasa	39,17	0	5,68	0,14	0,58
Población	349.305	530	2600	1243,08	415,50

Fuente: Ertzaintza y Open Street Maps. Elaboración propia.

En las figuras 4.2 y 4.3 se representan los clústeres de *hotspots* significativos ($p < 0,05$) de las infracciones contra la propiedad, violentas y los clústeres en los que se superponen los anteriores. De modo similar a como se indica en el mapa de densidad de Kernel, la mayoría de *hotspots* se localizan en la zona céntrica de la ciudad, a excepción de algunos clústeres (violentos y superpuestos) que lo hacen en barrios del extrarradio.

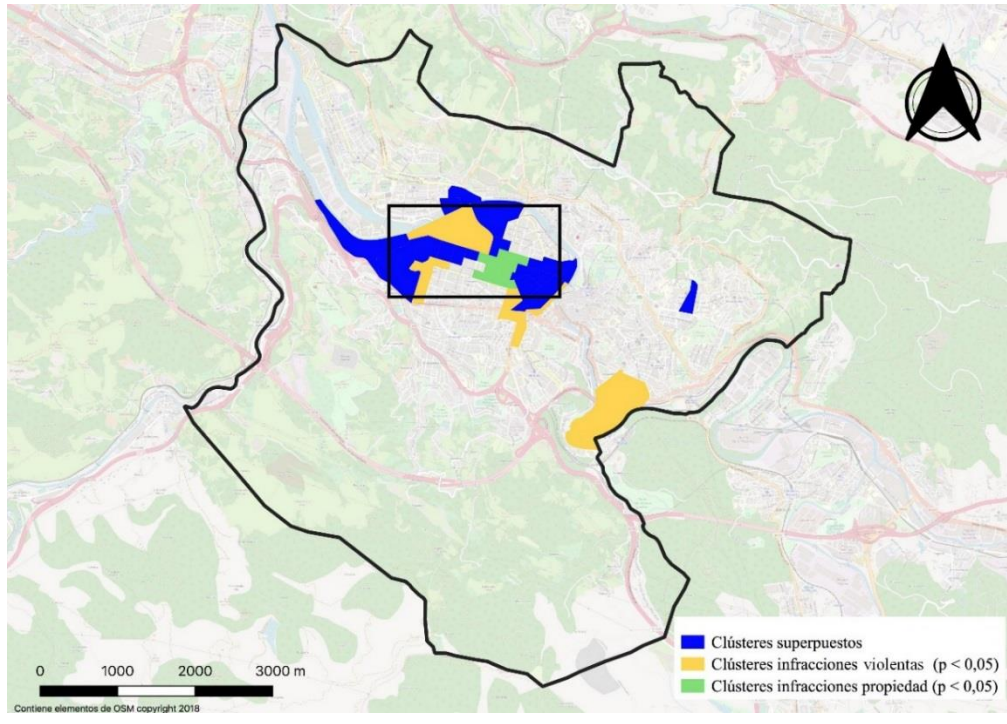


Figura 4.2. .Hotspots G* de Getis y Ord de la delincuencia juvenil en Bilbao.

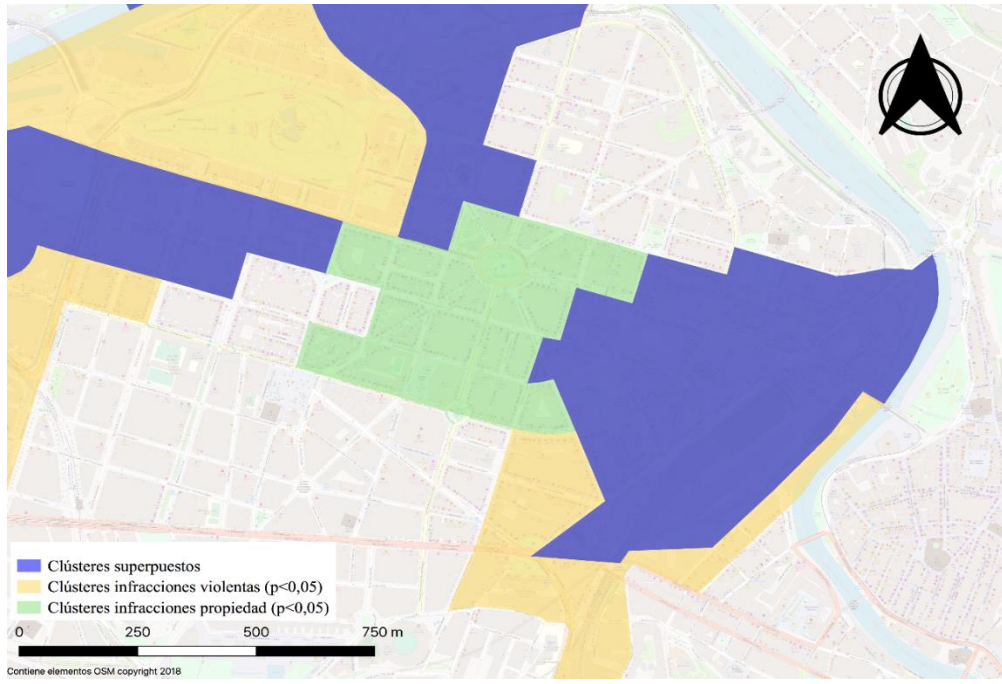


Figura 4.3.Ampliación a los clústeres hotspots de la delincuencia juvenil en Bilbao[10].

En la tabla 4.2 presentamos el recuento y el porcentaje de las instalaciones y los servicios que se encuentran dentro del área de influencia (buffer de 500 m) de cada clúster *hotspot*. Como se puede observar, los resultados son similares para los tres tipos de clústeres siendo los *comercios* la categoría con mayor porcentaje (> 30%), y en particular para las infracciones contra la propiedad. Siguiéndole a esta, se observa que las instalaciones relacionadas con el *turismo* son claramente el segundo tipo de instalaciones más presente (> 18%). La presencia de los lugares de *comida rápida, ocio* y *pubs* en cada clúster sería de más del 10% en cada categoría. El resto de las categorías, *bancos, parques, trasportes, centros educativos* y *aparcamientos* tenían una presencia por debajo del 6,5%. Y en el caso de *centros educativos, parques* y *aparcamientos* por debajo de 1,5%.

[10] Fuente: Ertzaintza y Open Data Euskadi. Elaboración propia

Instalaciones/ Servicios	Clústeres superpuesto		Clústeres contra propiedad		Clústeres violentos	
	N	%	N	%	N	%
Comercios	4357	31,71	7528	34,17	7126	30,10
Bancos	752	5,47	1343	6,10	1276	5,39
Pubs	1425	10,37	2245	10,19	2468	10,42
Comida rápida	1780	12,96	2940	13,35	3002	12,68
Turismo	2546	18,53	3606	16,37	4761	20,11
Parques	28	0,20	35	0,16	49	0,21
Trasporte	882	6,42	1263	5,73	1580	6,67
C. Educativos	179	1,30	292	1,33	297	1,25
Aparcamientos	188	1,37	301	1,37	346	1,46
Ocio	1602	11,66	2477	11,24	2773	11,71

Tabla 4.2. Instalaciones y servicios en los clústeres de Bilbao

Fuente: Open Street Maps y Open Data Euskadi. Elaboración propia.

4.4. Discusión

En el presente estudio hemos pretendido poner de relieve la importancia que reviste el diseño del contexto urbano, así como la localización de sus instalaciones y servicios, en la incidencia de la delincuencia juvenil. Tal y como hemos podido comprobar, los eventos delictivos analizados se encuentran concentrados en áreas muy delimitadas del espacio en las que, además, están disponibles tipos muy determinados de estas instalaciones y servicios. En concreto, nuestros resultados muestran que existe una alta concentración de infracciones en la zona centro de la ciudad, y de forma más precisa en lugares con una alta presencia de locales comerciales, servicios e instalaciones enfocados al turismo o al ocio y locales de restauración.

Podemos concluir, por tanto, que nuestros resultados confirman el cumplimiento de la hipótesis de la concentración de los delitos perpetrados por menores en espacios específicos (ver mapas 1, 2 y 3), al igual que lo observado en el estudio realizado en Seattle (Weisburd et ál., 2009). Cabe destacar el patrón espacial que la delincuencia juvenil sigue en nuestro contexto.

Efectivamente, todos los clústeres de *hotspots* cabrían en una circunferencia imaginaria de 1,5 km de radio trazada desde el centro de la ciudad. A excepción de algunos clústeres que se dan en dos barrios del extrarradio al este de la ciudad.

En este sentido, y acorde con la literatura precedente, podemos inferir que las áreas que se agrupan hacia el centro de la ciudad actuarían como espacios generadores del delito, ya que por sus características atraerían un mayor número de personas cuya intención primaria no sería delinquir (Brantingham et ál., 2017; Malleson & Andresen, 2016). Aun así, debemos de tener en cuenta que no hemos considerado el horario en el que se cometió el delito, por lo que no podemos descartar que muchas de las zonas donde existan clústeres de *hotspots* se lleven a cabo actividades ilícitas en las horas en las que los comercios y negocios están cerrados, por ejemplo, consumo y venta de tóxicos.

A diferencia de los clústeres de la zona centro, podríamos decir que aquellos de la zona extrarradio son zonas que, en principio, pueden concitar actividades delictivas ya que, a primera vista, no parecen lugares atractivos para uso comercial o laboral. De todas formas, sería preciso un análisis más profundo de las características ambientales y del tipo de dinámicas sociales propias de esos espacios. Un ejemplo de este tipo de estudios es la reciente investigación realizada por Norza Céspedes, Vargas Espinosa, Avendaño Prieto, Rincón y Ospino (2018) que tras identificar los *hotspots* de homicidios en Bogotá, aplicaron un instrumento de observación para el análisis de las variables socioambientales que se podían encontrar en los mismos. Los autores concluyen que las técnicas aplicadas sirven como base para la elaboración de estrategias situacionales de prevención del delito.

En lo que se refiere a las características espaciales de los clústeres *hotspot* de diferente naturaleza delictiva (delitos contra la propiedad y delitos violentos), y en contraposición con lo esperado, no existe una gran diferencia en

cuanto al tipo de instalaciones y servicios asociados a una u otra infracción, lo que podría ser explicado en virtud de la naturaleza menos flexible de los mapas cognitivos en personas jóvenes en comparación con las adultas. La evidencia ha señalado que las personas jóvenes no recorren distancias muy lejanas a su residencia a la hora de cometer un delito (Johnson & Summers, 2015).

En este sentido, el espacio de acción de las personas menores es bastante limitado, de ahí que ambas tipologías delictivas compartan características espaciales similares. También, en consonancia con la literatura científica, es preciso remarcar la alta concentración de espacios comerciales entre las características de los escenarios. Así, Bichler, Malm y Enriquez (2014) encontraron que los comercios y en especial grandes superficies comerciales eran lugares esencialmente *crimípetos.* De la misma manera, nuestros hallazgos corroboran la importancia de los lugares de ocio, comida rápida y bares en los escenarios delictivos. Al fin y al cabo, aquellos espacios son en donde los menores pasan gran parte de su ocio no estructurado –sobre todo realizando actividades de riesgo–, socializando con pares y en ausencia de adultos significativos, son los espacios más propicios para que las personas jóvenes delincan (Averdijk & Bernasco, 2015; Hoeben & Weerman, 2014; Tanner, Asbridge & Wortley, 2015).

Es necesario señalar que pese a que la evidencia señala los colegios y estaciones de transporte público como lugares generadores del delito (Hoeben & Weerman, 2014; R. K. Murray & Swatt, 2013), nuestros resultados han mostrado una baja presencia de los mismos en los clústeres de delincuencia. Una posible explicación podría ser que tanto los centros educativos como las paradas de transporte público están distribuidas por todos los distritos y barrios de la ciudad, por lo que no sería posible que en el análisis espacial realizado contribuyeran a discriminar entre unidades de baja o alta incidencia delictiva.

Nuestro estudio, como es obvio, no está exento de limitaciones. En primer lugar, hemos agregado los eventos delictivos no teniendo en cuenta la

hora en el que se han cometido. Muchos de los delitos ocurren a altas horas de la noche y otros como los hurtos en tiendas, sin embargo, solo pueden ocurrir cuando estas están abiertas. Adicionalmente, no nos es posible conocer la tendencia estacional de la delincuencia juvenil. Cabe decir que, en eventos delictivos con poca incidencia, como es el caso, desagregar los datos de manera temporal restaría robustez a los análisis ya que nos encontraríamos con muy pocos eventos para cada unidad de análisis, motivo por el cual no se han realizado análisis temporales. Por otro lado, los datos policiales solo permiten identificar aquellas infracciones en las que se conoce a la persona autora. El hándicap de las fuentes policiales u oficiales son aquellos delitos que no han sido detectados. Por lo tanto, estaríamos hablando de que nuestros datos subestiman las infracciones cometidas por las personas menores de edad.

4.5. Implicaciones prácticas

A pesar de las limitaciones que hemos indicado, las implicaciones prácticas de esta investigación son, a nuestro juicio, ciertamente notables. En primera instancia, los resultados obtenidos bien pueden sentar las bases de un programa de patrullaje predictivo que haga más eficiente la presencia policial en el espacio urbano (Ignatas & Pease, 2018). Por otra parte, el análisis de *hotspots* puede contribuir a identificar aquellos lugares donde la delincuencia es relativamente estable en el espacio y en el tiempo. A partir de dicho análisis, se podría profundizar en las variables asociadas a la agrupación de eventos delictivos juveniles *in situ* –ver el estudio sobre homicidios de Norza Céspedes, Vargas Espinosa, Avendaño Prieto, Rincón y Ospino (2018)–, y establecer estrategias tanto policiales como comunitarias para la prevención de este fenómeno. Es decir, una evaluación del contexto orientada a los problemas concretos.

Por lo tanto, la detección de los *hotspots* sería, sin duda, el primer paso. A modo de ejemplo de este tipo de estrategias de prevención cabe mencionar el

estudio realizado por Nussio y Norza Céspedes (2018) en el que utilizaron pósteres disuasorios de la Policía colombiana en las zonas con elevadas tasas de delincuencia en Bogotá. Si bien los resultados no mostraron una reducción de los delitos más bien espontáneos (por ejemplo, ataques violentos), sí se encontró una reducción de los delitos premeditados como robos o hurtos en tiendas. Los autores también observaron que el efecto disuasorio decaía con el tiempo.

En definitiva, el modelo de ciudad del siglo XXI exige que las estrategias de prevención del delito no sean desarrolladas mediante entidades descoordinadas en forma de compartimentos estancos. La ciudadanía, los agentes sociales, el gobierno local y la policía deben involucrarse en una verdadera política multinivel de reducción de la delincuencia y, en este sentido, un diagnóstico espacial puede ser de gran utilidad para alcanzar con éxito dicho objetivo.

5.
Assessing the relationship between facilities and juvenile delinquency

5.1. Introduction

Over the last decades, the relation between place and crime has received increasing attention in criminological literature (Bruinsma & Johnson, 2018; Weisburd et al., 2016). Specifically for juvenile delinquency, near socio-environmental characteristics of crime locations have been studied, finding a relation between crime scenes and specific facilities (Weisburd et al., 2009). Relevant facilities are those associated with juveniles' usual routes and with places where they spend most of their time (Brantingham, Brantingham, & Andresen, 2017; Felson, 2017; Johnson & Summers, 2015; Tanner, Asbridge, & Wortley, 2015).

The geometry of crime (Brantingham & Brantingham, 1981; Brantingham, Brantingham, & Andresen, 2017; Brantingham & Brantingham, 1993) and the routine activity (Cohen & Felson, 1979; Felson, 2017) perspectives provide the theoretical framework to explain these associations. As Brantingham et al. (2017) postulate, offenders build their activity space –and therefore their awareness space- around their activities nodes and the routes

between them. As those routes become more known, offenders will interiorise the paths stablishing their mobility patterns. Hence, it will be in those spatio-temporal patterns of space use where the coincidence with potential victims and the lack of capable guardians will provide the perfect setting to offend (Felson, 2017). As a result, offenders will tend to choose crime locations within their awareness spaces, close to the facilities they use most in their routines, but only when these places also offer attractive objectives and a reduced level of guandianship. And additional idea that is worth keeping in mind is proposed by Brantingham and Brantingham (1981; Brantingham et al., 2017): some locations will have relevant properties for crime. There are the crime generators –"*particular nodal areas to which large numbers of people are attracted for reasons unrelated to any level of criminal motivation"* (Brantingham et al., 2017, p. 108) - and crime attractors –"*particular places, areas, neighbourhoods, districts that create well-known criminal opportunities to which intending criminal offenders are attracted because of the known opportunities for particular types of crime"* (Brantingham et al., 2017, p. 108).

Studies based on these theoretical perspectives have been producing robust results that identify those facilities and amenities that most often surround crime settings (Demeau & Parent, 2018; E. R. Groff & Lockwood, 2014; Malleson & Andresen, 2016). In the specific case of juvenile delinquency, it has been found that schools, commercial areas, prosocial buildings or transport stations increase the likelihood of choosing a place for offending (Bichler et al., 2011, 2014; Johnson & Summers, 2015; Osborne et al., 2016; Tanner et al., 2015; Van Wilsem, 2009). Nowadays an interesting body of literature on the topic is available, but to our knowledge there is not research on this matter in southern European countries, with the only exception of a study mapping juvenile crime in a city of Spain (Vázquez, Molina, Struse, & Belmonte, 2014).

Therefore, the present study aims to contribute to the existing knowledge, adding evidence to the juvenile delinquency and place literature in a southern European region. In doing so, as it will be developed in the coming sections, we will use spatial and aspatial statistical strategies to explore the relation among several amenities and socio-economic characteristics and the settings where juveniles have offended over a 5 year-period.

5.1.1. Theoretical background

5.1.1.1. Use of the space

When analysing the relationship between place and crime, literature has pointed out that some facilities have a higher influence than others on juvenile crime (Bichler et al., 2014; Boivin & Felson, 2018; Groff & Lockwood, 2014). Schools, for example, have been linked to delinquency and considered as crime generators because of the amount of people with non-criminal purposes that they attract (Groff & Lockwood, 2014; Johnson & Summers, 2015; Murray & Swatt, 2013). Particularly, Johnson and Summers (2015) found that the presence of schools was positive related to juveniles choosing an area for offending (see also in Bernasco, 2019).

The influence of public transport stations has been also studied and it was found to be associated to crime (Baudains, Braithwaite, & Johnson, 2013; Bernasco, Johnson, & Ruiter, 2015; Groff & McCord, 2012; Haberman & Ratcliffe, 2015). The presence of a high amount of transport stations is a symptom of well-connected area, which implies not only the presence of higher ambient population -which means more potential victims or offenders-, but also easy mobility to run away when necessary. Other facilities that have been robustly associated to crime are the commercial areas and food related businesses such as caterings, restaurants, or fast food premises (Chen, Liu, & Sun, 2018; Weisburd et al., 2009). These are places where juveniles tend to spend much of their leisure time hanging around without supervision, without

any specific purpose and with peers (Tanner et al., 2015). In a recently study, Bernasco (2019) found that locations with retails and catering business are more likely to be chosen by adolescents to offend.

Another consistent finding in the literature is that bars, pubs and other night leisure businesses, as well as alcohol selling premises, are related to violent crime, due to the amount of non-residential people that they attract and the consumption of alcohol and other substances (Groff & Lockwood, 2014; Ratcliffe, 2012). This has also been found for juveniles: according to the results of Tanner et al. (2015) risky leisure, operationalised as going to bars or nightclubs –among other three risk activities-, is strongly associated with both property and violent offending.

Finally, some authors have discovered that even prosocial leisure places, which are expected to promote prosocial behaviour, such as sport centres, libraries, or schools can be related to a higher incidence of crime (Osborne, McCord and Higgins, 2016). This has also been found for parks (Groff & McCord, 2012), where people go to relax or to spend a prosocial leisure time – doing sport, picnics, or spend a family day. In their study, a large proportion of the crime incidents in Philadelphia was located in some parks.

5.1.1.2. Social disadvantages

The scientific literature has extensively explored the relevance of the social disadvantages for explaining crime events (Sampson et al., 1997; Shaw & McKay, 1942; Wikström & Treiber, 2016) and associations has been found either directly or indirectly. In this sense, Schepers (2017) suggests that "*social disadvantages are not causes of crime but causes of causes*", influencing other factors –such as crime propensity and criminogenic exposure- that are directly associated to crime. In an overlook of the neighbourhood studies in Europe, Pauwels, Bruinsma, Weerman, Wim, and Bernasco (2018) point out that the results for the social disorganisation variables are mixed. Moreover, taking in

account the context of the present study, Fernández-Molina and Bartolomé Gutiérrez (2018), in a recent study, have found an increase of delinquency among juveniles with socially disadvantaged backgrounds.

5.1.2. Current study

The aim of the present study was to assess the influence of the facilities and socioeconomic characteristics of settings on the locations where juveniles offend. It is known that juvenile delinquency events tend to cluster in specific parts of the city (Weisburd et al., 2009). Therefore, in order to analyse the characteristics of both kind of places –those without incidents and those with registered juvenile delinquency-, as a secondary objective we explored the localisation and the concentration of juvenile delinquency in our sample, allowing us to explore differences with the places where juvenile delinquency was not found, and to relate the incidence of juvenile crime to the variables of interest (facilities and socioeconomic characteristics).

Following previous evidence (Pauwels, Bruinsma, et al., 2018), we expected that opportunity variables, such as the presence of certain amenities, would explain better the juvenile delinquency than those variables related to social disorganisation (hypothesis 1). Particularly, we expected facilities involved in the daily life and leisure time of the juveniles to be positive related to juvenile delinquency (hypothesis 1a). Additionally, we predicted that the relationship between social disadvantages and juvenile delinquency would be weak or null (hypothesis 1b). Focusing on the location and concentration of the juvenile delinquency, as the literature suggests (Weisburd et al., 2009), we hypothesize that juvenile delinquency will be concentrated in a few specific parts of the city (hypothesis 2). Finally, taking in account the crime setting characteristics, and considering our first hypothesis, we also expect to find differences on the land use between those places where juvenile delinquency was found in our sample and where not. Specifically, we predict that a higher amount of the facilities

involved in juvenile's routine activities will be found in those places with juvenile delinquency events (hypothesis 3).

We believe that social daily routines and, above all, urban designs can significantly shape criminal patterns. Given that urban design in our context differs (Kasanko et al., 2006) from other cities where the majority of the research on this topic has been carried out, the current study might contribute to the existing literature of juvenile delinquency and place, adding evidence to the almost inexistent research in the south of Europe.

5.2. Method

5.2.1. Unit of analysis

In the current study we chose the administrative census tracts (CT) of the city of Bilbao (N =281) as study units. Bilbao is a medium-size city in the Basque Country Autonomous Community, a region located in the north of Spain that has an approximated population of 2,173,210 in 2015 (Eustat, 2019). In the city of Bilbao the total population in 2015 was 342,234 and the population between 0 and 19 years old was 55,286 (Eustat, 2019). Knowing that when doing spatial analysis "small is better" (see more in Oberwittler & Wikström, 2009), for this context and based on previous literature (Boivin, 2018; Boivin & Felson, 2018; Malleson & Andresen, 2016), we considered the CT a spatial unit small enough to display robust results and big enough to capture the influence that environmental variables and crime events could have in other CT.

5.2.2. Juvenile delinquency data

The variable of interest of the present study is composed by the juvenile (12-18 years old) crime incidents that the Basque police –*Ertzaintza*- recorded between 2010 and 2015. The initial sample was 351 events, however domestic violent events (N=79) were excluded because they do not have theoretical relation with the environmental criminogenic facilities, since those are often committed in

private settings such as their homes. Moreover, 138 crime events were dismissed due to not have the exactly geolocated point. As a result, our total sample was composed by 134 incidents committed by at least one person between 12 and 18 years old in Bilbao.

In order to add robustness to our analysis, the data was aggregated temporally. As previous literature has suggested, in crimes with low incidence and small unit of analysis a temporal aggregation adds stability to the results (Gerstner & Oberwittler, 2011; Messner et al., 1999). Once the incidents were geolocated, we aggregated the crime events as counts to each administrative CT in a shape file with Bilbao's CT that has been download from the public open data archive provided by the Basque Government, *Open Data Euskadi* (Gobierno Vasco, 2017). To do so, we used a Geographic Information System (GIS).

5.2.3. Environmental and Socioeconomic data

Taking into consideration the previous literature, we consider seven type of amenities as predictive environmental variables. As previously explained, literature has offered robust evidence of the association between juvenile delinquency and the presence of schools, bars or commercial areas. However, less is known about prosocial places or the presence of parks in relation to juvenile delinquency.

A shape file containing the building information that Open Street Maps (OSM) has from the city of Bilbao was obtained from *Geofabrik* (2018). Objects were identified with a tag that helped us to classify them in different groups of amenities, following previous research (Kinney et al., 2008; Malleson & Andresen, 2016). In order to complete the information about some of the variables with official data, we obtained additional geographic information for some facilities from Open Data Euskadi (2018) –such as education centres. As a results, the following groups of amenities were built: *education centers*

(schools, colleges, universities, etc.); *public transport*; *shops* (cloth shops, computer shops, shopping centres, etc.); *pubs*; *fast food restaurants* (restaurants and fast food restaurants); and *prosocial leisure amenities* (cultural centres, public buildings, sports centres, etc.)

A separate shape file was composed for each group, and objects in each CT were aggregated to obtain the percentage of those facilities per CT. Again, the process was done using an open access GIS.

Additionally, for predictors related to social disadvantages, we used information from the Population and Household Census 2011 of the Spanish Statistical Office (INE, 2018). Taking into account the literature on the social disorganisation perspective (Sampson et al., 1997; Shaw & McKay, 1942), we ran a principal component analysis (PCA) to construct a social disadvantages index. After running preliminary test (Bartlett's test and Kaiser-Mayer-Olkin test) for confirming the legitimacy of the analysis, the PCA showed a unique factor including the following variables obtained from the official data (INE, 2018): *a) percentage of foreign people, b) percentage of low studies,* and *c) percentage of unemployed people*. Since, the Spanish Statistical Office remove the information of 22 CT, the analysis containing this index will be run with a N=259.

5.2.4. Analysis

After running a series of descriptive and median difference analysis and being aware of the spatial characteristic of our data and the likelihood of spatial dependence, we ran spatial analysis. Among the variety of possibilities to check for spatial autocorrelation of the variables (Anselin, 1995; Messner et al., 1999), we chose the Global Moran's *I* statistics –using queen contiguity criterion to calculate the spatial weights- as it has been previously done (Berthelot, Brown, Drawve, & Burgason, 2015; Boivin, 2018). We also calculated the Anselin's

(1995) local indicator of spatial association (LISA) to identify any high juvenile delinquency clusters (*hotspots*).

A second step was to analyse the relationship between selected variables and juvenile delinquency, using negative binomial regression models. As previous evidence has shown, Poisson distribution models fit better the crime data than OLS models, when analysing low frequency crimes and using smaller population units (Boivin & Felson, 2018; Osgood, 2000; Lucia Summers & Johnson, 2016). Due to the presence of overdispersion in our data, we chose negative binomial regression over Poisson regression. Since negative binomial regression is a count model, to run the model with per capita juvenile crime rates, the log residential population of each CT was included in the model as an offset (see Osgood, 2000). The descriptive analysis and the model estimations were done using R 3.4.4. (R Core Team, 2017) and for the geographical analyses we used QGIS 3.2 (QGIS Development Team, 2017).

5.3. Results

5.3.1. Location and concentration

According to our data, juvenile delinquency is highly concentrated in a few places of the city. Specifically, 16.01 % of the CT in the city of Bilbao gathered the 100% of the juvenile crime events of our sample. Moreover, Moran's I statistics, which was ran for each variable, showed that *juvenile delinquency*, *public transport*, *shops*, *pubs*, *fast food restaurants*, *prosocial leisure facilities* and *social disadvantages* were spatially autocorrelated. This means that the CT with a high percentage of those variables tend to be surrounded by CT with similar characteristics. In particular, highly spatially autocorrelated are the *shops* (I=0.540, $p < .001$), *fast food restaurants* (I=0.532, $p < .001$) and *prosocial leisure amenities* (I=0.447, $p < .001$). Meanwhile, for *education centres* and *parks*, both statistically not significant predictors, a very low level of spatial correlation was found.

A Local Moran's I analysis of juvenile delinquency rates (calculated as counts per residential population in each CT) indicates –through the *hotspots* (please see the High-High CT in figure 5.1)- a high concentration in a few specifics part of the city; mainly in the center and its surroundings.

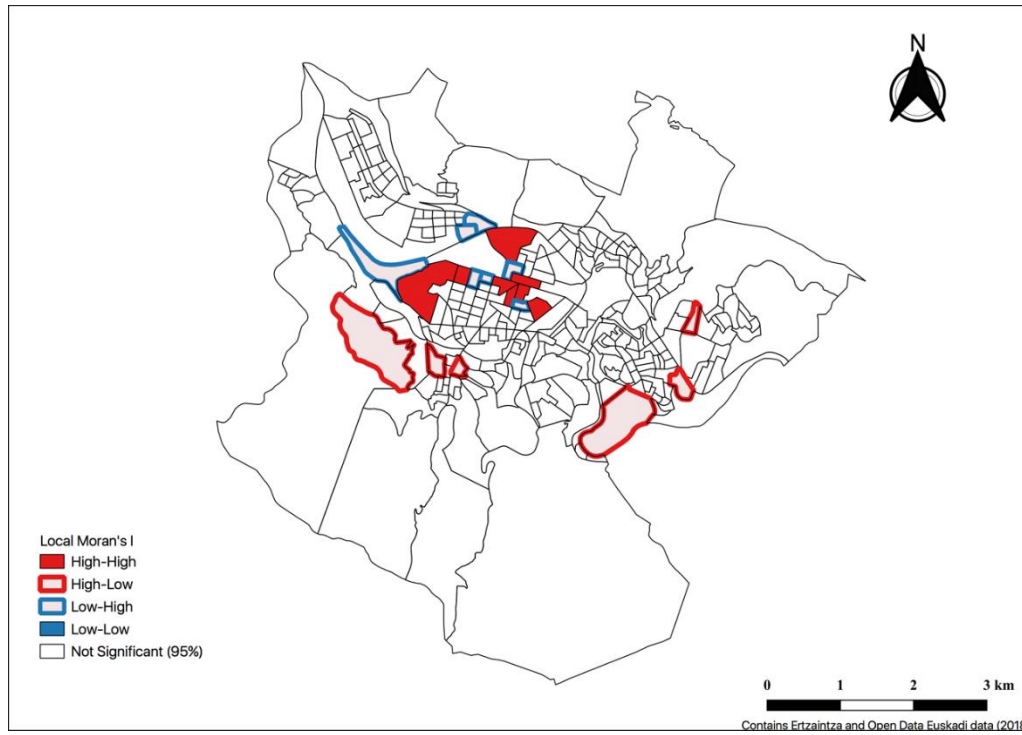


Figure 5.1. Juvenile delinquency rates hotspots (2010-2015).

Moreover, an analysis of the median differences between CTs with juvenile crime incidents or CTs without then showed that CTs with juvenile delinquency a have higher percentage of *public transport*, *shops*, *pubs*, *fast food restaurants*, and *prosocial leisure facilities* (see table 5.1); having the variables *fast food restaurants* and *prosocial leisure amenities* medium to large effect sizes (r = -.32 and r = -.34) (Field, Miles, & Field, 2012). These results confirm that juvenile delinquency is concentrated, while also pointing out to the crime concentrations being surrounded by some types of amenities.

Table 5.1. Mann-Whitney U test between Census Tracts (CT) with known juvenile delinquency and not found juvenile delinquency.

	CT No delinquency known		CT with delinquency			
	Median	Mean (SD)	Median	Mean (SD)	U	Effect size (r)
Education centers %	0	0.31 (0.65)	0	0.59 (1.07)	4,601.5 +	-0.11
Transport stations %	0.16	0.31 (0.43)	0.47	0.62 (0.51)	2,951***	-0.28
Shops %	0	0.21 (0.66)	0.19	1.12 (1.86)	3,077***	-0.29
Pubs %	0	0.25 (0.45)	0.40	0.89 (1.47)	3,7772.5***	-0.20
Fast Food restaurants %	0	0.21 (0.52)	0.22	1.10 (1.75)	3,012***	-0.32
Prosocial leisure amenities %	0	0.23 (0.44)	0.78	1.00 (1.27)	2,781.5***	-0.34
Parks %	0	0.32 (1.04)	0	0.54 (1.36)	4.996	-0.06
Social Disadvantages	-0.10	0.001 (0.97)	-0.45	-0.009 (1.17)	4758	-0.04

+ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

5.3.2. Estimated models

In order to assess the relation of the environmental and social variables and the juvenile delinquency, as previously stated, negative binomial regression models were run. This decision was taken after running analyses that showed the convenience of choosing negative binomial regression models over Poisson

ones (e.g. likelihood ratio test of alpha = 0, χ^2= 62.36, $p < .001$) (Hilbe, 2011). Moreover, the goodness-of-fit tests indicated a good fit of the data for all the models (Hilbe, 2011). The models presented in the table 5.2 also offer the AIC (Akaike Information Criterion) and the McFadden pseudo R^2. The variance inflation factor (VIF) did not show any sign of multicollinearity, with all variables having a VIF between 1.1 and 3.2 (Bowerman & O'Connell, 1990).

The negative binomial regression models are presented in Table 5.2. Model 1 included the studied amenities, and it was found that *transport stations, shops*, and *prosocial leisure amenities* were positive statistically significant predictor, as proposed in out hypotheses. But the rest of amenities presented a low regression coefficient and unexpectedly, *pubs, fast food restaurants,* and *parks* depicted a negative relationship with juvenile delinquency.

Table 5.2. Negative binomial regression models of juvenile delinquency.

	Model 1		Model 2	
Predictors	b	SE	b	SE
Intercept	-9.49***	0.26	-9.53***	0.27
Education centres %	0.17	0.23	0.24	0.22
Transport %	1.01**	0.37	0.75*	0.36
Shops %	0.65***	0.16	0.44**	0.15
Pubs %	-0.21	0.27	-0.25	0.26
Fast Food restaurants %	-0.06	0.25	0.14	0.24
Prosocial leisure amenities %	0.79*	0.32	0.72*	0.31
Parks %	-0.17	0.19	-0.10	0.19
Social Disadvantages	–	–	0.07	0.18
AIC	361.64		322.27	
McFadden Pseudo- R^2	0.15		0.25	
Log-Likelihood	-171.82		-151.13	
LR test	< .001		< .001	

+ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

In Model 2 social disadvantages were added as predictors along with the amenities. The statistically significant predictors in Model 1 continued as such in this second model. According to the incidence rate ratio (IRR) showed in Figure 5.2, the percentage of *transport stations* (IRR = 2.11, $p < .05$) had the strongest relationship with juvenile delinquency; indicating that when one unit of the percentage of transport station increases is related to an increasement of 211 percent in juvenile delinquency. The percentage of the *prosocial leisure amenities* (IRR = 2.06, $p <0.5$) also showed a great significant positive relationship with juvenile delinquency: an increment of one unit in this variables means that juvenile delinquency rises 206 percent. Finally, the percentage of *shops* (IRR= 1.56, $p < .01$) had a positive association with juvenile delinquency too. The rest of the variables remained statistically not significant and the percentage of *fast food restaurants* showed a positive relationship for this model in contrast of the previous one. As predicted, the results showed a low effect of the *social disadvantages* on our sample of juvenile delinquency (IRR=1.06, $p > .05$). Although both models fit properly the data, the *AIC*, *pseudo* R^2, and *Log-Likelihood* indicators (table 5.2) are better for Model 2.

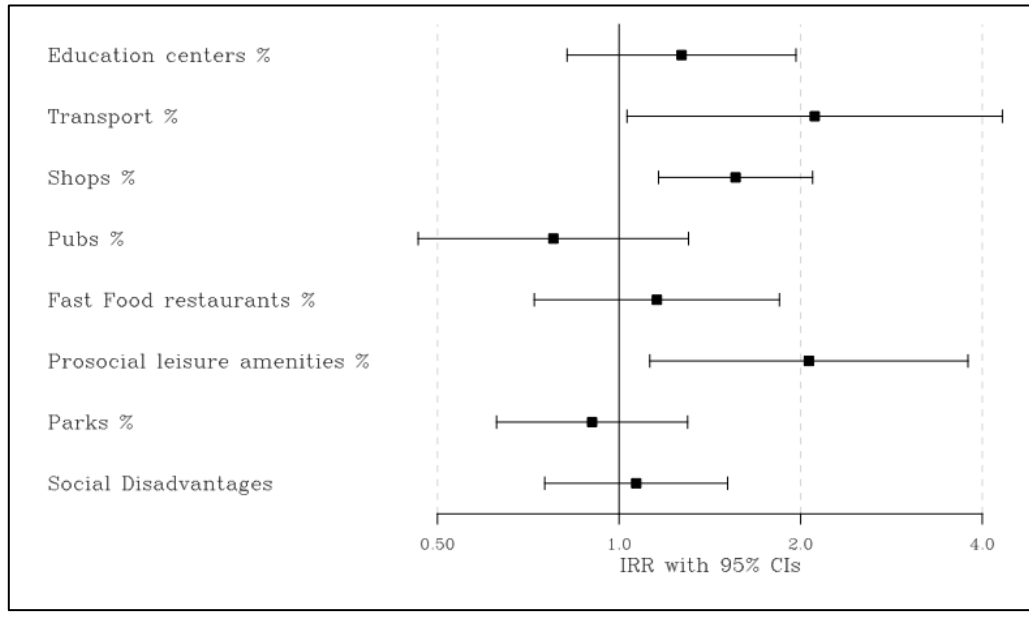


Figure 5.2. Incidence Interval Ratios with 95% of Confident Intervals.

5.3.3. Sensitivity Analyses

The robustness of our models was tested by various sensitivity analyses. First, we performed Moran's I test over the residuals of the models using the modification of Lin and Zhang (2007). Those analyses showed that the residuals of the models where not spatially autocorrelated. However, being aware of the spatial influence of the variables –as saw before- and not to fall in an under or overestimation of the aspatial models (Weisburd et al., 2016), and following previous literature (Boivin & Felson, 2018; Lucia Summers & Johnson, 2016), we also ran the models including a spatial lag variable of the crime counts – using queen contiguity-based criterion for the spatial weights. The results did not show substantial differences with the aspatial models.

5.4. Discussion and Conclusion

The main objective of the present study was to assess the association between the socio-environmental characteristics of an area and the juvenile delinquency. As secondary aims, we explored the location and concentration of juvenile

crime incidents and the differences with those census tracts where such incidents were not found in our sample. For doing so, we used police records to conform our dependent variable and various official sources, as well as non-official ones, to compose our predictors. We then used spatial and aspatial statistical analysis –such as local Moran's I or negative binomial regressions- to test our hypothesis. The results of our study partially support the formulated hypotheses, as we will explain below. Overall, our findings support the idea that some facilities are more related than others to juvenile delinquency (Bichler et al., 2014), however, other results do not go along the lines with some international outcomes. Among the facilities considered in our study, juvenile delinquency was positively associated with those amenities that, apparently, involve the greatest amount of people presence along the day, confirming partially our hypothesis 1a. Additionally, our outcomes supported the hypothesis 1b, related to the social disadvantages, therefore confirming our hypothesis 1. Moreover, along with the international literature, our results confirmed the concentration of the juvenile delinquency in a few parts of the city (Weisburd, Morris, & Groff, 2009). Our spatial analysis also depicted that most of the *hotspots* where in or nearby the center of the city (hypothesis 2). In the same way, our analysis of median differences showed significant differences in the percentage of amenities for those CTs where juvenile delinquency was found in our sample (hypothesis 3). Those results can be theoretically supported by the opportunity theories (Brantingham & Brantingham, 1981; Brantingham et al., 2017; Cohen & Felson, 1979; Felson, 2017).

We had predicted that juveniles would offend near the places where they spend more time or part of their leisure time according to previous research (Brantingham et al., 2017; Wikström, Ceccato, Hardie, & Treiber, 2010). However, our results do not necessarily support this idea. The percentage of transport stations, shops, and prosocial leisure facilities increase the likelihood

of juvenile delinquency, but schools, pubs, fast food restaurants, and parks seem to be irrelevant in our sample.

Our results are in line with those showing the relevance of transport stations as criminogenic spaces (Bernasco, Johnson, & Ruiter, 2015; Groff & McCord, 2012; Groff & Lockwood, 2014; Haberman & Ratcliffe, 2015; Mburu & Helbich, 2015; Zahnow, 2018). There are amenities where juveniles can commit offends such as fare evasion or disorders, and also places that attract a great amount of citizens along the day. Therefore, following the crime pattern theory and the routine activity theory, transport stations would be places where juvenile delinquents could find suitable targets on their way to, for example, education centers or leisure areas. So, as previous evidence suggests, transport stations can play a crime generator or attractor roles depending on the part of the day and the location of the city where they are located (Haberman & Ratcliffe, 2015; Zahnow, 2018).

Additionally, our findings support the idea that commercial areas provide juveniles with the necessary elements to offend (Bernasco, 2019; Malleson & Andresen, 2016). Shops can be considered as a constant element when discussing juvenile delinquency, since a large number of their offenses are related to shoplifting, as the self-reported data from the International Self-Report Delinquency Study showed in 2015 for the Spanish sample (Fernández-Molina & Bartolomé Gutiérrez, 2018). Furthermore, shopping areas usually are places where juveniles spend much of their leisure time hanging out with peers, which increases the risk of delinquency (Averdijk & Bernasco, 2015; Osborne et al., 2016). Finally, our results also confirmed that despite the activities carried out in prosocial facilities, these amenities can increase juvenile delinquency (Osborne et al., 2016), probably because of similar reasons: availability of targets and juveniles spending time with peers around those places.

Contrary to our expectations, the presence of pubs and parks was not a predictor of juvenile crime incidents. In relation to pubs, it should be noted that the minimum age for entering these night life installations is 18 years old. As a result in Bilbao, as in the majority of the cities of the Basque Country and Spain, the teenagers usually drink alcohol with peers in alternative locations, such as locals rented by a group of friends, out of the control of any official or non-official authority, or in certain open-air public places, often after dark, a routine that is known as *botellón* (Gómez-Fraguela, Fernández Pérez, Romero Tríñanes, & Martín, 2008; Pedrero-García, 2018).

In relation to the social disadvantages, and confirming our hypothesis, our results showed a practically null effect on the juvenile delinquency, in line with the results of most European studies (Pauwels, Bruinsma, et al., 2018). A possible explanation for this pattern is the differences among social welfare systems across the world. In particular, the Autonomous Community of the Basque Country has traditionally been one of the regions of Spain that has invested, and continues investing, more resources in the social welfare systems (García et al., 2017; Herrero-Alcalde & Tránchez-Martín, 2017; Peña-Longobardo et al., 2016), which might be filling the gap of the social disadvantages. Another plausible reason for the null effect of the social disadvantages is that juveniles would choose places with more opportunities, in terms of suitable targets, to offend. The city center certainly provides more targets, while also being the city area with less social disadvantages.

Furthermore, our results confirms the well-established Weisburd's law of crime concentration in the place (Weisburd, 2015). As happened with adult crime, Weisburd, Morris, and Groff (2009) demonstrated that juvenile delinquency clustered in a few parts of the city of Seattle. This is also true for our context, and this concentration is given in places with a high volume of amenities such as commercial and leisure areas in the city center. Relying on

opportunity theories, we understand that juveniles, when hanging around, spend most of their leisure time in the city center and in the shopping centres nearby, areas well connected by public transportation systems. Since they do not usually drive private vehicles, and due to their limited experience, their mobility is also more limited than the one found for adult offenders (Drawve, Walker, & Felson, 2015; Johnson & Summers, 2015) and therefore, their crime activity spaces will be constricted to smaller set of locations where higher opportunity is found due to the greater amount of suitable victims or objects (Felson, 2017).

5.5. Limitations and final thoughts

We should acknowledge a number of limitations in our study. First, the use of residential population as an offset, when there is abundant literature about the use of ambient population. However, in our context a trustworthy data source to measure this variable is not available yet. We should also keep in mind that police data are not recorder with research purposes –even though is a reliable source and one of the closest to the phenomenon (Fernández-Molina & Bartolomé Gutiérrez, 2018)- and, therefore there are incomplete in many ways. The most remarkable reasons for it are, according to Bernasco (2019), the underreported crime in western countries as shown in the International Crime Victimization Survey (ICVS) and the offenders that have been not caught by the police.

Recapitulating, our study has shown that juvenile delinquency is associated to those amenities that usually gather more people. Furthermore, our results also support that opportunity variables explain better the crime than variables coming from the social disorganisation, as other European studies have confirmed in other countries (L. J. R. Pauwels, Bruinsma, et al., 2018). We should also highlight that, as initially expected, our results differ, somehow, with previous studies done in America and Europe. For example, certain facilities such as schools or restaurants, have been positively associated with

juvenile delinquency (see for exampe Bernasco, 2019), but our outcomes did not show evidence of it. We could infer, therefore, that some of our juveniles' routine activities might differ from youths' lifestyles in northern countries in Europe.

Despite the mentioned limitations and taking into account the possible ecological fallacies, we believe that this study can be useful in different ways. First, contributing with evidence to the existing literature on the spatial influence on juvenile delinquency. Second, although retrospective data has been used not allowing to prevent directly the juvenile delinquency (Bernasco, 2019), our results can help to reinforce different prevention strategies such as predictive patrolling (Ignatas & Pease, 2018). As Bernasco (2019) has recently demonstrated, previous crime locations is the variable with the greatness robustness when predicting juvenile delinquency. Finally, we must not forget the implications that this study can have in urban planning or policy. This kind of studies can help authorities to plan a better distribution of the amenities or to plan the new urban development in a less criminogenic way (Boivin & Felson, 2018).

6.
Juveniles' Residence-to-Crime

6.1. Introduction

Research on journey-to-crime has showed its relevance for the study of offenders' mobility patterns and for exploring the offenders' motivations behind the travelled distance to offend (Rengert, Piquero, & Jones, 1999). Authors from the situational and environmental perspectives within Criminology have provided key concepts for understanding those mobility patterns, having impact in other disciplines such as Sociology or Psychology. The *distance decay* pattern (Brantingham and Brantingham 1981; Rengert et al. 1999), has shown that most offenses occur near to offenders' residences or routine activities locations and that the probability of an offence happening decreases as the distance from the residence increases. But within this general rule, some places will provide more attractive opportunities for crime or antisocial behaviour (Brantingham et al., 2017). The situational perspective has also highlighted the relationship between individuals and their surroundings, and how situations can act as active agents that provide or increase criminal or anti-social motivation (Wortley, 2017).

The study of the journey-to-crime is, in most cases, the study of the distance between the offender's registered residence and the location of the crime scene, for both theoretical and practical reasons. On one hand, the place we live in is considered the most relevant anchor point (Bernasco, 2010) and, on the other hand, it is unusual for researchers to have access to the point of origin of a given journey to a crime scene and the followed route across the city. As a result, the linear distance between the residence and the scene is one of the most used measures in this kind of studies. Keeping in mind that it is a simplified proxy for the actual journey to the crime scene, it provides a measure of the geographical range of action and allows to make comparison across studies and geographical settings. Therefore, probably a more appropriate label -and the one we will use across this paper- for what we are measuring is "residence-to-crime" (RC from on) distance, as proposed by some authors (Rossmo et al. 2004; Ackerman and Rossmo 2015).

6.1.1. Theoretical backgrounds

6.1.1.1. Juveniles' residence-to-crime patterns

The environmental theories have shown that juvenile delinquency, as well as general crime, concentrates at specific points avoiding a random distribution (Weisburd, 2018; Weisburd, Groff, & Yang, 2012; Weisburd et al., 2009). Literature also confirms that most juvenile offenses happen close to their homes (Johnson and Summers 2015), and the distance decay function could be more obvious for younger offenders since their mobility patterns are restricted due to their shorter experience and knowledge of the city and not to being able to drive a vehicle. Therefore, their routine activity settings are bounded to their educational centres, and leisure nodes, usually near their homes. Furthermore, prosocial places, such as schools, sport facilities, libraries, etc. have been found to attract juvenile delinquency (Osborne et al., 2016). Given that those places

attract a considerable quantity of people, the opportunity to find a suitable target is higher.

Theoretical and empirical efforts to describe and understand juveniles' residence-to-crime journey have been carried out from the main situational perspectives –crime pattern theory (Brantingham & Brantingham, 1981), routine activity theory (Cohen & Felson, 1979), and rational choice perspective (Cornish & Clarke, 1986).

Research on juvenile's mobility supports the hypothesis that residence location is a key element for youths (Bichler et al. 2012; Johnson and Summers 2015; Wikström et al. 2010). Juvenile offenders will offend close to their homes but also around their activity nodes or areas they know (Bernasco 2010; Felson 2017; Johnson and Summers 2015). If their residences are located at isolate areas, they will travel greater distances (Bichler et al., 2012) and conversely, distances will be shorter when the offence happens in residential areas than in settings with bigger stream of people, such as shopping centres (Levine & Lee, 2013). The fact that some juveniles travel farther could seem illogical –since it increases the cost of the offence- but the evidence has suggested that the expectation of a reward weights more than the possible risks (Ackerman & Rossmo 2015). Thus, the characteristics of the residential area will play a role; juveniles will feel more attraction for places where the number of suitable targets and the absence of handlers create a favourable situation for offending.

Some additional evidence is available about the characteristics that could make an area more attractive for juvenile crime. In relation to socioeconomic disadvantage, some scholars have found that offenders prefer more disadvantaged areas (Baudains et al. 2013; Johnson & Summers 2015), while others do not find significative results for this variable (Ackerman & Rossmo 2015), being the evidence not conclusive at the moment.

Regarding to the density of population in the area where juveniles live, a higher density could provide more opportunities for crime, but some scholars found that residence-to-crime distance increased when the house density was higher around the delinquents' residence when those had access to a motorised vehicle (Bichler et al., 2012). Other studies show a decrease in the travelled distance when the density was higher at the crime location (Vandeviver et al., 2015). A plausible explanation for these results is that areas with higher density can be highly monitored, so juveniles prefer to travel further, but a high-density location not far for home, once the *buffer zone* (Rossmo, 2000) has been surpassed, provides close opportunities while neutralising the described risk.

In addition to the location of the residence, juveniles' activity nodes have found to be relevant, as previously mentioned, and often, to play the role of *crime attractors* (Brantingham et al., 2017), where they might locate their targets. Schools attract juvenile delinquency (Johnson & Summers, 2015; Murray & Swatt 2013) and can also play an indirect role in the selection of crime scenes; according to evidence juveniles configure their awareness space while walking to their schools (Bichler et al., 2011). Moreover, scholars have also found some facilities, such as shopping centres, to be a key 'magnetic' elements that attract juvenile offenders (Bichler et al., 2014).

As age increases, juveniles start travelling farther (Ackerman & Rossmo 2015), until their early twenties when the peak seems to start decreasing (Andresen, Frank, & Felson, 2014). Once older juveniles have access to a motor vehicle, it will allow them to cover longer distances. Some scholars even conclude that once the juveniles have the minimum age to get the driven license, their travel patterns will be similar to the adults' ones (Bichler et al., 2012). Yet, there are complementary explanations to the increase of the residence-to-crime distance with age: *awareness spaces* are not static, and they change as our routine activities do so (Andresen et al., 2014). Thus, as the juveniles become

older, and therefore more independent, their cognitive maps expand providing knowledge about new opportunity settings (Brantingham et al., 2017; Moser et al., 2014).

To sum up, despite the advances made in the exploration of residence-to-crime, there are ambiguous results in some issues, such as the distance decay or the effect of housing or population density (e.g. Bichler et al. 2012; Townsley, 2017; Vandeviver et al. 2015). For example, it has been found that when assessing individual crime trips those do not follow the distribution shape of the distance decay rule (Townsley, 2017). Despite those limitations, RC studies can be helpful in many ways, for instance, to aid police investigations (Ackerman & Rossmo, 2015), to better understand the routine activities of the juvenile offenders, or, importantly, to improve the situational prevention of juvenile delinquency. For being able to do so, we propose that a deeper understanding of which environmental and situational characteristic of the crime event are relevant across different countries and contexts could highly benefit the control and prevention of juvenile crime and antisocial behaviour at a regional and local level.

6.1.1.2. Is the geographical and cultural context relevant?

Most studies considering environmental and structural features, such as juveniles' RC, have been done in west-central Europe or in northern America (Pauwels et al., 2018; Telep & Weisburd 2018). Certainly, all of the literature cited above has been produced in those areas of the world, in contexts with their own peculiar characteristics, in relation to variables that affect RC distance: city size and design, location of services (schools, libraries, commercial areas and so on), travel patterns (use of vehicles vs. public transport systems and active mobility), minimum age for getting the driving license, and so on. This means that the variables that can influence juveniles' mobility behaviour have been only tested in those environments. Therefore, it seems reasonable to expect that

in southern Europe, as well as in other areas of the world, with different patterns of city design and use, the role played by some variables, or their relevance, might be different, and also the mean or median values for RC distance could vary.

To our knowledge, a single study has been done before in the south of Europe (see Vázquez et al., 2014). In the current study, we have aimed to provide additional evidence on juveniles' RC in our country, while trying to go deeper into the analysis of data by following the analytical strategies that better adjust these type of data (Hilbe, 2011) and that have been also used in the recent studies (Vandeviver et al., 2015). Moreover, we explore a bigger area than an individual city by considering a whole region, allowing us to take into account movements across towns or from smaller towns to the city. In this way, we expect to provide a more complete image of youth's RC patterns.

6.1.2. Current study

In the present study, we aim to describe the residence-to-crime distances for juveniles in the Basque Country region (Spain) and to study the effect of several predictors on those distances. As previously mentioned, long-travelled distances are a cost for offenders (Vandeviver et al., 2015), so if the juveniles travel further to offend, they could be focused more on the possible rewards and choosing a place that offers what they consider appropriate opportunities for crime (Cornish & Clarke, 1986). Therefore, we also tried to understand the influence that environmental and situational factors in the crime location had on the juvenile delinquents' mobility decision making.

Our research on juveniles' RC may contribute to reduce the very limited evidence regarding RC in countries outside USA and west-central Europe, highlighting general patterns that follow existing literature and detecting factors that could be culturally of geographically specific. We also try to offer

additional information in relation to those aspects of RC where ambiguous evidence has been found in the literature.

Following the previously exposed literature, we expect juveniles to travel relatively short distances for committing an offence (hypothesis 1), staying in their awareness and activity spaces (Johnson & Summers, 2015). In relation to potential predictors of juveniles' RC, multipurpose places and transport stations, such as, shopping centres or train stations, will reduce the distances, as well as the presence of prosocial places, such as schools, libraries or sport facilities (hypothesis 2), because they are places with more people and therefore attractive targets (Levine and Lee 2013) and also part of their nodal points of activity. We also expect juveniles to travel further if the social disadvantages are smaller in the event location, implying wealthier targets (hypothesis 3). The role of housing density is not clear in previous literature and the density in the studied settings could very much differ from the scenarios analysed in previous literature, and therefore we included the variable with an exploratory aim. Focusing on the characteristics of crime events, some authors have concluded that property crimes involve further displacement (Frank, Andresen, & Felson, 2012) and that the presence of peers acts as a situational motivator (Hoeben & Weerman, 2016). Hence, our hypothesis is that violent crimes or events involving more than one juvenile will be related to shorter travelling distances (hypothesis 4).

6.2. Method

6.2.1. Data sources and sample

Data was extracted from the juvenile delinquents' sentences of 2016, provided by the Basque Government Department of Juvenile Justice. The Basque Country is an autonomous community at the north of Spain that borders France in the northeast. Composed by three provinces –Araba, Bizkaia, and Gipuzkoa, it has an area of 7,234 km^2, and in 2016, the total population was 2,189,534 and the

juvenile population –people between 14 and 17 years old- was of 75,606 inhabitants. The Basque Country includes 251 municipalities, including three main cities –Vitoria-Gasteiz, Bilbao, and Donostia-San Sebastián, with a population between 180,000 and 350,000 inhabitants; 39 municipalities with a population between 10,000 and 100,000 inhabitants; and 209 towns with less than 9,999 residents. The Basque Country had a juvenile delinquency rate (6.5 per thousand) lower than the national average (7.6 per thousand) in 2016.

It should be noted that we had access to all the 332 juvenile sentences of the mentioned year. As other authors have suggested, family violence events should be dismissed since most of these events generally occur into delinquent's home, or when members of the family travel together, not covering any distance or not doing real residence-to-crime trips, respectively (Ackerman & Rossmo, 2015; Tita & Griffiths, 2005). In addition, we removed the events no related to family violence but with the crime scene and the offenders' residence location being coincident. In most cases, these are offenses that happen in minors-of-age detention centres against mates or social educators, and again, they imply no mobility. 147 sentences were excluded due to these reasons. We excluded 50 additional ones –taking the most serious offense as a selection criterion- to avoid the over-representation of mobility patters of those some juveniles that committed more than one offense, and thus, to compose a sample of a single event and single RC per offender. As a result, our sample was composed of 135 crime events committed by juveniles between 14 and 18 years old.

6.2.2. Procedure and variables

Using the sample of 135 sentences, the information was extracted and codified in a dataset that included location of offenders' residence, location of the criminal event, gender, age, nationality, and event details, such as crime type or the presence of co-offenders and the places where the criminal events happened. In addition, complementary information was gathered for each crime event by

adding information about the census track where it happened, obtained from the Spanish National Statistics Institute (Instituto Nacional de Estadística (INE), 2011); and by including environmental data from Open Data Euskadi, the Basque Government's spatial information infrastructure (Gobierno Vasco, 2017). The event scenes were in 102 different census tracts.

More specifically, we recorded the variables described below, along with the strategy for codifying them.

RC distance. We measured the outcome variable using the Euclidian distance between the delinquent's residence and the location where the crime happened as a proxy of the mobility scope (Beauregard et al., 2005; Brantingham & Brantingham, 1981; Davies & Dale 1995; Lundrigan et al. 2010). We used the Euclidian method instead of street-network or Manhattan distances because it allows comparisons with other studies, as mentioned before (Groff & McEwen, 2007) and correlates highly with street-networks measurement (Ackerman & Rossmo 2015).

Socio-environmental variables. We incorporated several social and environmental features measured in the census tract where the event scene was located. Following the described literature, we considered them factors that affect the level of attractiveness and the fact that an area offers (or not) better opportunities for juvenile delinquency, and, therefore, potential predictors for the travelled distance. Specifically, *housing density* was calculated by considering the number of residences and the area (square kilometres) of each census tract. We also elaborated a *social disadvantage* index using the following information: a) percentage of single parents, b) percentage of people renting houses, c) percentage of people with lower studies level, d) percentage of people without studies, and e) percentage of foreign people. Following previous evidence (Ackerman & Rossmo 2015; Sampson et al., 1997) and after verifying the pertinence of the analysis (Kaiser-Meyer-Olkin measure, Bartlett's test, and

Kaiser's criterion), we run a principle components analysis that corroborated a unique factor structure. Then, the obtained factor regression scores –standardised to mean of zero and standard deviation of 1– were used to reflect social disadvantage level in each census tract where events occurred. Finally, we included the presence of *educational centres*, *sport facilities*, *libraries, shopping centres* and *train/underground stations* drawing a buffer of 402.332 meters around the event area using a GIS (Geographical Information System) software. Not having any reference for our context, we consider the distance –transformed from feet into meters- for some amenities that Weisburd, Groff, and Yang (2012) used in their study.

Event variables. We coded the nature of the offense (0= non-violent; 1= violent), and the presence of co-delinquents when committing the offence (0= alone; 1= accompanied).

Control variables. In order to avoid spurious inferences of our results, we included the following delinquents' individual characteristics as control variables in the regression analysis: gender (0= male; 1= female), nationality (0 = national; 1= foreign), and age (0= from 14 to 15 years old; 1 = from 16 to 17 years old).

6.2.3. Analytic Strategy

For testing the hypotheses, analysing the effect of socio-environmental and event variables on juveniles' RC was needed. The characteristics of our data violate basic assumptions of ordinary least squares (OLS) regression. In those cases, Poisson regression is commonly used to compute count-based and highly skewed data (see Figure 6.1), but the distribution of the data was, for our sample, over-dispersed, with the variance (89.63 km) bigger than the mean (5.99 km). In consequences, negative binomial regression -based on the Poisson-gamma mixture distribution- is more adequate for this type of data (Meldrum & Clark, 2015; Reingle et al., 2011; Vandeviver et al., 2015), since it is more

flexible for over-dispersed data assuming that the mean follows a Poisson distribution and the variance a gamma distribution (Hilbe, 2011). Therefore, the negative binomial regression was chosen as the analytic strategy, as will be presented in the results section.

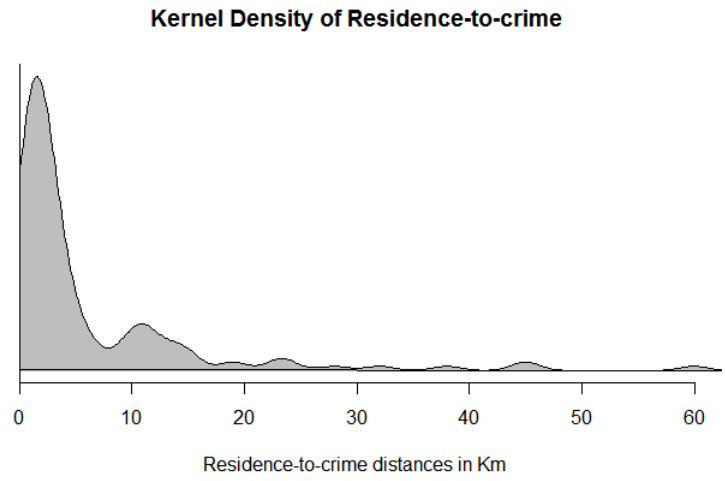


Figure 6.1. Kernel density for juveniles' RC distribution.

6.3. Results

6.3.1. Descriptives

The residence-to-crime distance for the juveniles in our sample offered a median value of 2 km with a minimum of 0 km and a maximum of 60 km. A small number of zero cases was caused by the rounding error in the infractions committed next to juveniles' residences. The RC mean was 5.99 km and its variance 89.63 km, indicating over-dispersion, as previously explained; but also showing a distribution that is expected for this type of variable, according to the literature.

The Spearman correlation matrix for the variables included in the study is shown in the Table 6.1. There are important correlations between some environmental characteristics, such as a public transport (r_s = .44, p < .001),

prosocial places (schools), and housing density (r_s= .31, p < .001). It is expected to find more public transport stops in those places where more people live and around educational centres. Nevertheless, as will be explained later, no multicollinearity problems were found.

Table 6.1. Descriptive statistics and Spearman correlation matrix of the variables (N=135).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Shopping centres	1.00												
(2) Train stops	.04	1.00											
(3) Schools	.20*	.28**	1.00										
(4) Libraries	.05	.19*	.06	1.00									
(5) Sport centre	.20*	.21*	.11	.21*	1.00								
(6) Social disadvantages	-.10	-.06	.15	.02	-.03	1.00							
(7) Housing density	-.06	.44***	.31***	.13	.12	.08	1.00						
(8) Type of offense	-.01	.07	.02	.07	.13	-.12	.16	1.00					
(9) Co-delinquents	-.05	.03	-.20*	.13	.01	-.08	.00	.03	1.00				
(10) Gender	.15	-.07	.06	.02	.11	.02	-.13	-.03	.06	1.00			
(11) Nationality	.00	.11	-.02	.07	-.08	-.02	.04	.05	.26**	.07	1.00		
(12) Age	-.03	.18*	-.05	-.03	.04	.10	.15	.01	.21*	-.05	.25**	1.00	
(13) Distance	-.09	.10	.00	-.06	-.09	.09	.06	.02	-*.00	-.03	.17	.23**	1.00
Mean	.10	.56	.73	.32	.27	0	8.25	.48	.39	.21	.31	.42	5.99
Variance	-	-	-	-	-	1	71.6	-	-	-	-	-	89.63

*p< .05; ** p < .01; *** p < .0

6.3.2. Estimated models

The likelihood-ratio tests of $\alpha = 0$ corroborated that a Negative Binomial model was better option than Poisson model (e.g. LR = 647.80; $\Delta df = 1$; $p < .001$) since α was greater than zero (Hilbe, 2011). Furthermore, the deviance statistic, used as a goodness-of-fit test, showed that our four models properly fit the empirical data (Hilbe, 2011). Collinearity diagnostics do not show a variance inflation factor (VIF) higher than 1.5 (Bowerman & O'Connell, 1990) nor a tolerance statistic (1/VIF) over 0.6 for all the models (Menard, 1995) and therefore, there was not a multicollinearity problem. The significance of the regression coefficients (*b*) was tested by a Z-test, indicated with asterisks in Table 6.2. We also report the incidence rate ratios (IRRs), as a relative measure of effect (Tripepi et al., 2007), calculated by exponentiating the regression coefficient (e^b) (Hilbe, 2011).

	M0 –intercept-only		M1 –environmental		M2 –environmental and event		M3 –full model	
	b	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)
Intercept	1.790***	(0.105)	1.485***	(0.218)	1.502***	(0.254)	1.678***	(0.275)
Environmental characteristics								
Shopping centres: presence			-0.720+	(0.381)	-0.740+	(0.380)	-0.754*	(0.373)
Train stops: presence			0.280	(0.237)	0.306	(0.237)	0.221	(0.234)
Schools: presence			0.499*	(0.251)	0.504*	(0.256)	0.409+	(0.248)
Libraries: presence			-0.073	(0.227)	-0.051	(0.228)	-0.047	(0.222)
Sport facilities: presence			-0.715**	(0.248)	-0.641**	(0.248)	-0.575*	(0.244)
Social disadvantages			-0.021	(0.101)	-0.011	(0.104)	-0.071	(0.099)
Housing density			-0.001	(0.014)	-0.000	(0.140)	0.002	(0.013)
Event characteristics								
Type of offense: violent					-0.237	(0.254)	-0.264	(0.200)
Co-delinquents: yes					0.093	(0.206)	-0.128	(0.219)
Individual Controls								
Gender: female							0.108	(0.255)
Nationality: foreign							0.448*	(0.225)
Age: > 16							0.488*	(0.213)
N	135		134		134		133	
df	134		125		123		119	
Deviance	147.31		143.96		143.89		141.36	
Log-likelihood	-384.77		-374.21		-373.54		-366.71	
AIC	773.55		766.44		769.09		761.43	

Table 6.2.Estimated and multivariate predictors of crime trip: negative binomial models.

+p <.1, *p <.05, **p <.01, ***p <.001

When developing the successive models, the likelihood ratio test (LR = 21.11; df =8; $p < .01$) and a smaller AIC-value confirmed, as expected, that a model with the environmental characteristics (M1) fitted the data better than the intercept-only model (M0). Adding event characteristics (M2) seems to worsen the previous model fit (LR = 1.34; df = 2; $p > .05$), however the adjustment was still better than for M0. Finally, the full model (M3), that controls gender, nationality, and age, significantly improved the model fit in comparison to the previous models (e.g. LR= 15.01; df = 6; $p < .05$).

Looking at the environmental predictors in Table 6.2, a negative significant effect of the sport facilities indicated that juvenile delinquents covered shorter distances when those were present at the crime event location. Specifically, the presence of a sport facility accounts for a 78 percent decrease in the residence-to-crime when the events and individual characteristics are included (IRR = 0.562, $p < .05$). In M1 and M2 the presence of a school increased the likelihood that juvenile delinquents travelled further (IRR=1.648 and 1.656 respectively; $p < .05$). However, the effect loses it statistical significance (IRR = 1.506; $p < .1$) when gender, nationality and age entered into the equation. While control variables dropped the significance for some predictions, they enhanced the significance for others. For instance, the presence of shopping centres; there was a strong negative association with the distance that juveniles travel to offend when individual characteristics are taken in consideration (IRR = 0.470; $p < .05$). On the other hand, the presence of train stations increased the distance that juveniles travelled (IRR = 1.248; $p > 0.05$), however, those results were not statistically significant. Social disadvantage and housing density had a non-significant effect as can be seen in Table 6.2.

Focussing on the individual characteristics, entered as control variables, we find that juveniles older than 16 years old travelled longer distances (IRR = 1.63, $p < .05$). Additionally, the results showed that foreign juveniles travelled further to offend (IRR = 1.56, $p < .05$). A post-analysis exploration (see Figure 6.2) indicates that many of the non-national's residences are located far from the main cities. Moreover, the mean distance travelled by foreign juveniles was of 6,614.43 meters, while national juveniles travelled an average of 4,885.22 meters.

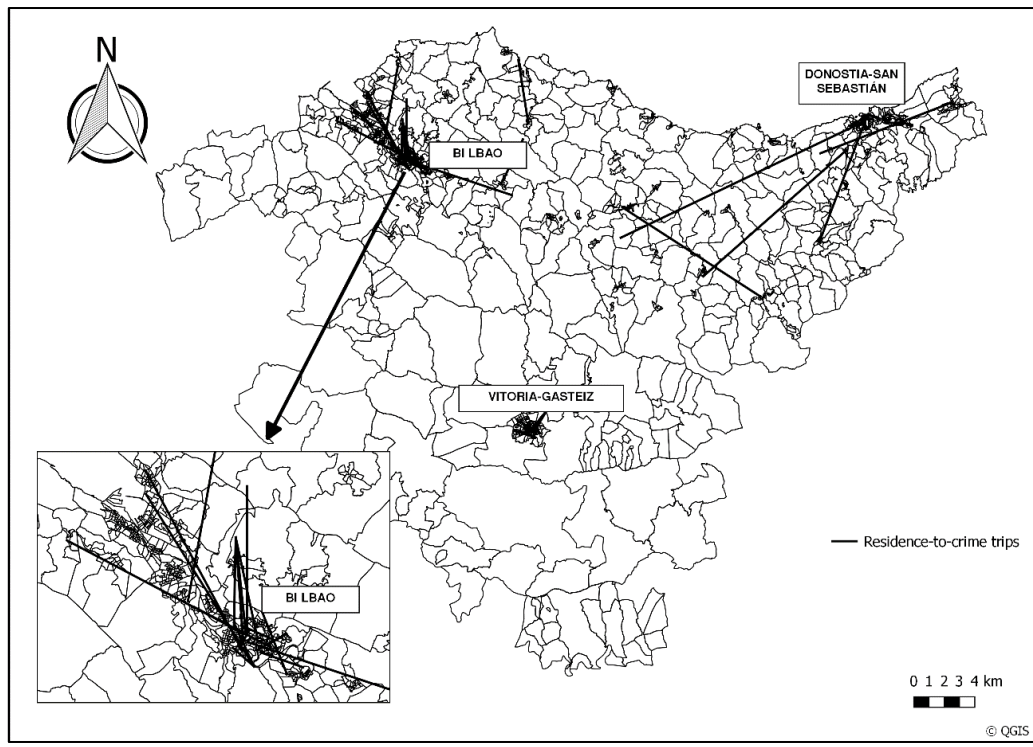


Figure 6.2. Foreign juveniles' RC in the Basque Country.

Finally, to better visualise the result of the full model (M3), Figure 6.3 depicts IRR (squares) and their associated 90% confidence intervals (CI) (horizontal bars) of the M3. Predictors with a CI's bar that intersect with the vertical line are not statistical significate.

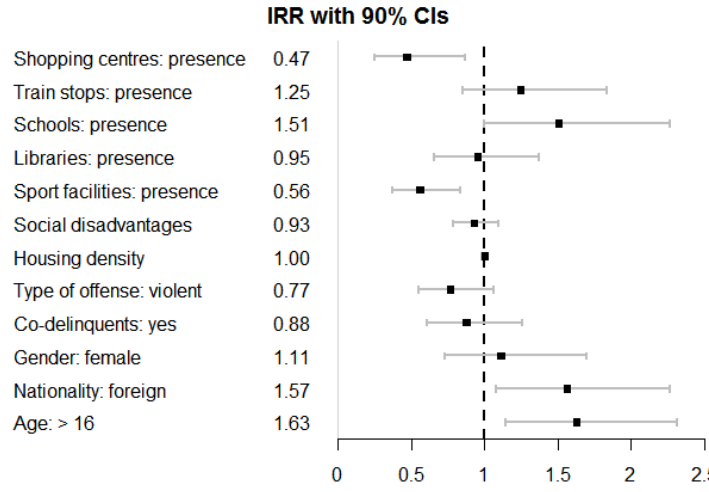


Figure 6.3.Forest plot of the IRR with 90% confidence intervals of the M3

6.4. Discussion

Our aim was to corroborate international studies on juveniles' RC and add knowledge to the way previously studied predictors relate to RC distances in our geographical context and culture. Along the line with our first hypothesis, and as previous studies have shown, most RC distances were short, corroborating that juvenile delinquents act in their awareness spaces (Bernasco, 2010; Brantingham et al., 2017; Menting, Lammrs, Ruiter, & Bernasco, 2016). When comparing with the previous studies, our mean and median RC distances were shorter than the outcomes of studies done in the north of America (Bichler, Christie-Merrall, & Sechrest, 2011; Bichler, Orosco, & Schwartz, 2012; Drawve, Walker, & Felson, 2015), and longer than trips of juvenile delinquents in other European regions (Levine & Lee, 2013; Vázquez et al., 2014). A plausible explanation for those differences is the design of the space in North America and Europe. While North America presents a spread urban design (Filion, 2001), in Europe there is a mixture of styles –compact and dispersed- (Kasanko et al., 2006). Focusing in the difference between RC distances in other European cities and our study, a reasonable explanation lies on the selected area for analysis. While our study contemplates a whole region, Levine's and Lee's (2013) and Vázquez's et al. (2014) studies are run in individual cities.

In relation to the effect that socioenvironmental features have on juveniles' decision to cover longer or shorter distances for committing an offense, and following the reviewed literature, we introduced in our model some of the plausible routine activities nodal points such as schools, sport facilities, shopping centres, or libraries; as well as public transport stations, social disadvantages and housing density as potential predictors.

Our results showed that some environmental characteristics are related to juvenile delinquents' RC distances. Particularly, event locations where shopping centres and sport facilities are present are chosen by juveniles that live closer;

while areas where a school is present seem to attract juveniles from more distant residences. Therefore, the second hypothesis would be only partially confirmed, for two concrete predictors, shopping centres and sports facilities. Those results are not surprising since shopping centres and sport facilities represent activity nodes where youths socialise with peers, therefore being familiar with the opportunities in the area (Murray & Swatt, 2013; Osborne et al., 2016; Averdijk & Bernasco, 2015). Other expected variables, as presence of libraries, were irrelevant, or even worked in the opposite direction: presence of schools is related to longer RC distances. This could be related to peculiar characteristics of out geographical setting, or to cultural factors in our country. First, in the studied region, medium size cities or towns are usually equipped with commercial areas and public sport centres, and even in the larger cities, this type of places will be found in every neighbourhood or, at least, district. Given the age of the sample (14 to 17 years old) a high school will not be available in every neighbourhood; and for the smaller towns, juveniles will usually travel to a different town or city when they start in high school. Therefore, the fact that offenses located around educational places are further for juveniles' residences could be a characteristic pattern of our region. The irrelevance of the location of libraries could be related to cultural factors; in our country, is much more usual to find groups of adolescents in commercial areas or practising sport than using a public library, which is a habit much more common for children and families.

The third hypothesis was rejected, since we expected juvenile delinquents to travel farther when the chosen target area had fewer social disadvantages and our results did not show a statistically significant effect. The result is in line with other authors that have included other variables when measuring this concept, such as people below poverty line, percent receiving social welfare assistance, people linguistically isolated, or residential mobility (Ackerman & Rossmo, 2015). Additionally, Wikström and Treiber (2016) have recently concluded that social disadvantages are partially related to the crime

when measured in the delinquents' residence areas, moderating other variables, such as crime propensity or exposure to criminogenic settings, that might have a direct connection with crime involvement. Therefore, this factor could be less relevant in the area where the event happened. Housing density, that we introduce with an exploratory aim, is also not related to RC; and in fact, this seems reasonable in our geographical context, where most areas of the cities have high buildings with the residence units being flats. This design pattern is found both in the centre of the city and in the residential neighbourhoods. In rural areas, independent houses and low buildings are common in the whole town. Therefore, is not probable to find relevant variations of density in the median distance that a juvenile would travel for offending.

Contrary to what we expected in the fourth hypothesis, event characteristics were not related to the juveniles' RC. Therefore, we should assume that the differentiation between property and personal crime and acting alone vs. acting with other juveniles do not systematically affect the decision to travel further. Due to the complexity of the juvenile delinquency, it seems quite simplistic to reduce the analysis to the type of the crime to a dichotomous measure. Relying on previous evidence (Ackerman & Rossmo, 2015), we assumed that violent crimes answered to a more irrational explanation involving more immediacy, and thus, shorter covered distance, but a more sophisticated and detailed analysis of the type of crime and the concrete circumstances of the event could help, in future studies, to test this assumption in a more reliable way. Additionally, we could consider an alternative explanation: for juveniles, short trips are common for every RC distance, since their awareness space is more reduced, and they act thinking on short term results; and therefore the previously exposed assumption could have more sense for adult offenders.

Even though we introduce them as control variables, the results of the personal variables showed partial support of previous evidence. Confirming our expectations and in line with the latest evidence, younger delinquents travel

shorter distances than those closer to the adulthood (Johnson & Summers, 2015; Andresen et al., 2014). Previous studies have demonstrated that juveniles increase the travelled distance until their mid-twenties, and then gradually decrease it (Andresen et al., 2014; Ackerman & Rossmo, 2015). A plausible explanation is that juveniles become more independent through the years, as well as they reach the minimum age to get the driven licence. Those elements might widen their awareness space, and in consequence, give them the chance to travel greater distances (Townsley, 2017).

Although the gender of the juvenile did not show significance in our study, the direction of the effect points that juvenile females travel longer distances. The scientific literature has demonstrated mixed results in this point (Levine & Lee, 2013; Clarke & Eck, 2003; Townsley, 2017). Finally, our results did not corroborate previous studies (Nichols, 1980; Philips, 1980), since foreign juveniles undertook longer trips than national juveniles. Townsley (2017) mentions that in the United States, there is bigger concentration of foreing people in the inner-city locations. Our data suggest that in Spain (or at least, in the Basque Country) foreign juvenile delinquents have their residences out of the main cities which makes them travel longer distances for their daily activities and therefore, to offend.

6.5. Limitations and future research

We should acknowledge some limitations that could offer future research avenues for a more complete understanding of juvenile offending in our context. First, despite juvenile justice sentences providing useful information, we must not forget that the aim of this type of official documents is not to be used for research, and therefore, a considerable amount of information was missing, which affected the sample size. We are not aware that the lack of data for a number of cases was related to any systematic cause or limitation, but it is not possible to dismiss the risk either. Although this is a limitation to consider, some

scholars suggests that this kind of samples can contribute better than big samples for, for example, running the hypothesis test (Serrano-Maíllo, 2009). Second, most of our variables where measured as dichotomised variables and some information that other strategy could provide might be missing.

Hence, future research should face the challenge of using validated tools to measure -in a more sophisticated way- the features of the settings chosen by juveniles to offend, in order to explore the specific characteristics of those locations and relate them to the travelled distance. Additionally, studies of the urban design's characteristics and their relation to juvenile delinquency mobility at different types of Western cities might wide the range of variables that the scientific literature currently contemplates.

6.6. Conclusion

Despite those limitations, our study has corroborated the relevance of the situational approach when explaining juveniles' residence-to-crime, and the need to consider environmental variables for a deeper understanding of the juveniles' offending patterns. Specifically, a significant finding in this study is the confirmation of the role of semi-public settings as commercial or sportive areas to gather events committed by juveniles who live close to them. We corroborated international findings on the matter, therefore implying that the trend is more probable to be found across western countries, including the south of Europe. But our study also highlights the importance that culture and differences in urban and regional design could have on the juveniles' routine activities and the role they play on the juveniles' residence-to-crime trips, since some results suggested some specific patterns for the studied context, that should be replicated in the future and tested in other contexts. Therefore, we would like to finish underlying, once more, the necessity of replication in order to look for the "genuine scientific knowledge" (Rosenthal & Rosnow, 1984 qtd. as cited in Thompson, 2013, p.18)

7.
Environmental conditions in youth delinquency events: A temporal, meteorological and situational perspective

7.1. Introduction

The study of youth delinquency has been essential for understanding the aetiology of delinquent behaviour. A number of longitudinal and cross-sectional studies done with youth people have determined the multifactorial genesis of this phenomenon (e.g. Moffitt, 1993; Wikström, 2004). The individual, social and situational perspectives on the topic have found that variables such lack of self-control, callous, inappropriate parental skills, antisocial peers or risky leisure activities play a relevant role in juvenile delinquency (Heelen J. Janssen et al., 2016; Jolliffe, Farrington, Piquero, Loeber, et al., 2017; Tanner et al., 2015). However, less attention has been paid to the environmental and situational characteristics of the criminal events committed by youths, among them, meteorological and temporal variables.

Most of the research about temperature and weather has been framed from the temperature-aggression (T-A) and the routine activity theory (RAT). The first approach assumes a physiological effect of the weather in the individual; and the results found from this perspective have given rise to a variety of hypotheses that could be described as contradictory: for example, some scholars support the idea that the relationship between temperature and aggressive behaviour is linear (Anderson, 1989), while others propose that it is curvilinear (Rotton & Cohn, 2000). On the other side, the RAT understands that crime happens when an offender and suitable victim/target coincide in the absence of a guardian (Cohen & Felson, 1979). Felson (2017) also suggests that most of the crime occurs following a simple *modus operandi* and that delinquency feeds to people's daily routines. Therefore, assumptions from this perspective will come from a social activity and the use of the space point of views. A pleasant climatology would enhance people –both potential victims and offenders- to engage in more outdoors activities, which could increase the likelihood of them sharing a space without a guardian, and therefore the likelihood of offenses to happen.

There is an extensive body of literature exploring the relationship between temporal and meteorological variables and crime, with most studies focused in violent crime (Ceccato, 2005; Cheatwood, 1995; Sommer, Lee, & Bind, 2018; Tompson & Bowers, 2013) and property crime (L. W. Mburu & Helbich, 2016; Van Koppen & Jansen, 1999; Yan, 2004). To our knowledge, the amount of research focused on juvenile delinquency from this point of view is very limited. Thus, our main aim is to explore the relevance that temporal, meteorological and other situational characteristics of the crime event have in violent and non-violent criminal events by juveniles.

7.1.1. Theoretical backgrounds

7.1.1.1. Youth delinquency

To define the concept 'youth' is not an easy task since it is a flexible concept that often implies a broad range of ages. The youths -identified also as adolescents, teenagers or juveniles- live an unstable period between childhood and adulthood (Newburn, 2002). It is during this stage of their lives when young people are more likely to engage in antisocial behaviours, and even delinquent behaviours (Newburn, 2002). Moreover, most of them will desist their wrongdoing activities when entering into the adulthood, but a small group will develop a delinquent career (Moffitt, 1993; Piquero & Moffitt, 2014).

From a legal perspective, the minimum age for criminal responsibility oscillates between 10 and 16 years old in the states of the European Union (EU) according to a recent report (European Union Agency for Fundamental Rights, 2018). The age of majority, when they acquire full legal capacities, is 18 years old for all EU members. From this point of view, youth delinquency can be understood as any act against the law committed by someone between 10 and 17 years old.

7.1.1.2. The importance of meteorological conditions

Research related to meteorological variables has confirmed the existence of a seasonality for both violent and property crimes (Breetzke & Cohn, 2012; Ceccato, 2005; Hipp, Bauer, Curran, & Bollen, 2004; Tennenbaum & Fink, 1994). Specifically, peaks of violent and property crimes have been found during summer in different parts of the world. For example Hipp, Bauer, Curran, and Bollen, (2004) found that property crime had a significant oscillation between the winter and the summer in different states of the United States, and in Brazil, Ceccato (2005) found that homicides peak their highest levels in summer and autumn.

One explanation for this seasonality is the temperature-aggression relation. Hot temperatures have been associated with high levels of hormones, such as adrenaline (Al-Hadramy & Ali, 1989) or testosterone (Andersson, Carlsen, Petersen, & Skakkebæk, 2003), which are related to stress situations. This could play as a situational precipitator ending in a violent crime (Wortley, 2017). Therefore, in warmer seasons, such as summer, more violent delinquency is expected. When shaping the relationship between temperature and violent behaviour, Anderson and Anderson (1984) found, in Chicago, a positive linear relationship between temperature and assaults, however the authors also postulate that a decrease in the number of assaults could happen when the high temperatures continue during several days. A study in Dallas by Rotton and Cohn (2000), confirmed Baron and Bell's (1976) idea that the relationship follows an inverted U-shape rather than a linear one, suggesting that when temperatures reach extremely high degrees an escape effect happens, with individuals avoiding places when the weather is too hot. A more recent study by Towers, Chen, Malik, and Ebert (2018) with a large dataset from Chicago confirmed the positive association between temperature and some violent crime (e.g. assaults or batteries). The authors found that including temperature improves the predictive power of the model only for aggravated assaults, batteries, and criminal damages. Predictive models for crimes against property, such as vehicle theft or frauds, however, did not show relevant improvements when including temperature. They also showed the complexity of the association between weather and crime and how it changes depending on other factors such as the hour of the day (see also in Tompson & Bowers, 2015) or the type of the crime.

Another explanation for the seasonality could be the rain. Following the RAT, with unpleasant weather -a raining day- people would do less activities outdoors, having less contact with others. Therefore there would be less opportunities that offenders and suitable victims converge in a space and time.

However, the research on the relation between rain and crime has found some contradictory results. Some scholars do not find significative evidence of the association between crime and rainfall (Simister & Cooper, 2005; Simon, 1992), while others found that some crimes are increased and others decreased: Sommer et al. (2018) found less violent crime and aggravated assaults in raining days in Boston while in Tokyo, hit and run cases increased with the rain (Ikegaya & Suganami, 2008).

7.1.1.3. Crime and temporal patterns

Temporal patterns are also important for understanding the occurrence of crime. Daily activities regulate the time that we spend at home and outdoors therefore affecting our exposure to crime. Moreover, time schedules might moderate the effect of other variables on crime, for example, temperature (Tompson & Bowers, 2015; Towers et al., 2018) as previously mentioned. Daylight or level of darkness could be even more relevant than the hour of the day itself, since daylight/darkness can facilitate crime by increasing the awareness of the space of the offenders or reducing the level of guardianship (Pooley & Ferguson, 2017; Tompson & Bowers, 2013). Tompson and Bowers (2013) examining the effect of temperature and levels of darkness on street robberies in London and Glasgow, found that level of darkness was more relevant than temperature.

When studying temporal patterns, researchers have also taken into consideration whether there is more prevalence of crimes on weekends/bank holidays or workdays. Evidence has shown different results, although that could be due to the type of crime analysed (Ceccato, 2005; Tompson & Bowers, 2015). For example, Ceccato (2005) studying the homicides in Sau Paulo, Brazil, found that weekends and holidays were significant in all the run models: most killings happened on weekends at evenings. Similarly, Pooley and Ferguson (2017) found that most cases of youth misbehaviour with fire occurred on weekends. On the contrary, Tompson and Bowers' (2015) results showed a

negative statistically significant relationship between robberies and weekends, and a lack of influence for public holidays.

7.1.1.4. Other situational events characteristics: Type of place and company

The place where crime happens has been a matter of interest for scholars studying delinquency from a situational perspective (Brantingham & Brantingham, 1981; Cohen & Felson, 1979). Research has confirmed that young people tend to offend near the places where they spend most of the time (Bernasco, 2019; Drawve et al., 2015; Weisburd et al., 2009). The presence of certain facilities –for example, regional shopping areas, movie theatres or schools- also increases the likelihood of youth delinquency to happen (Bichler et al., 2014; Weisburd et al., 2009). Considering the type of the places, public and semi-public places have more influence on youth delinquency than private ones (Hoeben & Weerman, 2014). It can be concluded that the characteristics of the crime setting have an important predictive power for youth delinquency (Bernasco, 2019).

The presence of peers has been acknowledged as an essential risk factor in youth delinquency (Burt & Rees, 2015; Osgood et al., 1996). Research on this topic has found that the presence of peers can influence young people to consume substances, to behave aggressively, or to commit acts of vandalism (Burt & Rees, 2015; Hoeben & Weerman, 2016; Tanner et al., 2015). Often, when young people spend time with their peer groups, they do not to participate in structured activities, they hang out or socialise in an unstructured way. The unstructured socialisation with peers without the present of a significant handler is a robust predictor for any type of youth crime, as the evidence has pointed out (Hoeben & Weerman, 2014, 2016; Maimon & Browning, 2010; Osgood et al., 1996).

7.1.2. The present study

In the current study, we aim to explore the environmental characteristics surrounding youth delinquency events in the region of the Basque Country (Spain). Specifically, we examine whether temperature, rainfall, weekend/bank holidays, time schedule, or darkness levels are related to youth violent and nonviolent criminal events. Moreover, we explore how different types of places or being alone vs. being with peers are associated to those events. Additionally, as previous research has found, we examine whether each type of youth offense -violent or nonviolent- presents seasonality.

Our research intends to contribute to the current literature adding evidence to the limited research regarding youth delinquency and temporo-meteorological characteristics, by offering additional information about topics that have found ambiguous results in the international literature.

Based on previous evidence, we expect to find seasonality in violent and nonviolent crime events -hypothesis 1- (Breetzke & Cohn, 2012; Ceccato, 2005; Hipp et al., 2004). Specifically, we assume that violent and nonviolent events will both have higher prevalence during the summer months (Ceccato, 2005; Hipp et al., 2004). Regarding meteorological variables, based on the TA perspective we hypothesize that higher temperatures will enhance violent offenses more than nonviolent, and following the RAT rainfall will decrease the likelihood of violent event to happen -hypothesis 2- (Anderson & Anderson, 1984; Sommer et al., 2018). In relation to the temporal patterns, we expect that the level of natural darkness will increase violent behaviour (Tompson & Bowers, 2013) and that weekends and public holidays will have more violent events committed by youth -hypothesis 3- (Pooley & Ferguson, 2017). Finally, and based on the routine activity perspective, we expect that youths' violent offenses to happen in public places and accompanied by other peers -hypothesis 4- (Hoeben & Weerman, 2014). To be able to contrast these hypotheses, in the

following section data collection and codification will be explained, as well as the followed analytical strategy.

7.2. Data and analytical approach

7.2.1. Data

7.2.1.1. Youth cases

Data about youth delinquency events was provided by the *Ertzaintza* -the Basque Autonomous police. A total of 2,174 incidents involving youths between 12-17 years old were recorded in the Basque Country (Spain) over 5 years (2011-2015). For each incident the police had recorded: the date when the event happened, the people involved -anonymised with a unique ID-, their birth date, their birth country, the type of offense, the neighbourhood where the offense happened, and the city. To compose our dichotomous dependent variable, we codified the cases in violent (1) and nonviolent (0). The violent events (N=1,004) gather type of offenses such as homicide or attempt of, sexual aggression, aggravated assault, domestic violence and intimate violence partner. Among the nonviolent events (N=1,170) it was possible to find offenses such as crimes against public health or against traffic safety, motor vehicle thefts, shoplifting, thefts or vandalism.

7.2.1.2. Meteorological information

We recorded the meteorological data from the detailed historical information that *Euskalmet* -the Basque Meteorological agency- registers in its weather stations. Having the date when an event happened and the neighbourhood where it was committed, we were able to gather the information of the temperature (ºC) and the rainfall (mm). To do so, we selected the nearest weather station to the neighbour where the event was committed, and the closest registered hour considering the date and time of the event. *Euskalmet* historical data offers

information for every ten minutes, thus if an event happened at 09:18, we gathered the information recorded at 09:20.

7.2.1.3. Darkness and nonworking days

To determine the level of darkness we followed the method used by Tompson and Bowers (2013). In doing so, we divided the day in four shifts (4 a.m. - 9.59 a.m.; 10 a.m. - 3.59 p.m.; 4 p.m. - 9.59 p.m.; and 10 p.m. - 3.59 a.m.) and value of 0 was given to the offenses that drop in the shift that represent no darkness at all (10 a.m. - 3.59 p.m.) and those events that occurred in a shift of darkness (10 p.m. - 3.59 a.m.) were given a value of 1 -representing six hours of darkness. For the offenses that were committed in the shifts that change from daylight to darkness or vice versa, we calculated the proportional time considering the sunrise and sunset hour.

Moreover, to determine whether an event had happened at weekend we followed Tompson and Bowers (2015) criterion to consider weekend from Friday 4 p.m. to Monday 4 a.m. Thus, we codified it as a dichotomous variable (weekend = 1; nonweekend= 0). Regarding public holidays, we use the work calendars facilitated by the Department of Employment and Social Affairs of the Basque Government to dichotomously codify the events (public holiday = 1; workday = 0).

7.2.1.4. Type of places and presence of peers

We classified the type of places where the event occurred in public -spaces where access is completely free, such as parks, squares, public parking, streets, etc.-, private -home or someone else' home-, and semi-public -everything that was not private or public- as Bernasco, Ruiter, Bruinsma, Pauwels, and Weerman (2013) did. In relation to the presence of peers, we calculated the age of the people involved in the crime event and assigned 1 to those cases in which more than one person between 12 a 17 years old were present, and 0 when that was not the case.

7.2.2. Analytical approach

After running descriptive statistics, we used two types of analysis in order to test our hypotheses. First, a one-way ANOVA was used to test the seasonality for violent and nonviolent events. Secondly, we carried out a logistic regression to identify the factors associated to violent events. For the regression analysis, level of darkness was converted to a dummy variable because it violated the assumption of linearity. Thus, we categorized the variable in three groups: null or low darkness (0-.329), medium (.33 - .709), and almost total or total darkness (.71-1). Then we created the dummy variable using as a base category the "null or low darkness" one. Additionally, we introduced the type of place as dummy as well, using the "private spaces" category as previous research had done (Bernasco, Ruiter, et al., 2013). The model was run with 2,002 events due to missing data (N=180). The traditional test of goodness-of-fit -*pseudo-*R^2 and deviance statistic-, showed that the model fitted well (Field et al., 2012; Hilbe, 2009). Moreover, the VIF test did not show any multicollinearity problems. In the model (see table 2), the odds ratio (OR) and the confidence interval (CI) at 95% are showed to assist with interpretation.

7.3. Results

7.3.1. Descriptive

The table 7.1 presents the descriptive data of the variables. Additionally, figure 7.1 shows the youth crime counts by month and type of crime. As shown, violent events seem to peak in September and March; and to plumb in April and August. Nonviolent events seem to be more regular along the months, with a light increase in April and a notorious decrease in November. The figure also depicts, as said before, that nonviolent events go over violent offenses. It is interesting to highlight, however, that the last trimester, when both type of offenses decreases, violent events surpass the nonviolent.

Table 7.1. Descriptive data of independent variables

	N	Min.	Max.	Mean	SD
Temperature (ºC)	2066	-1.70	35	14.93	6.02
Rainfall (mm)	2067	0	83.40	2.90	6.97
Darkness level	2092	0	1	.39	.38
Public Holiday	2174	0	1	.04	.19
Weekend	2166	0	1	.41	.49
Public place	2172	0	1	.59	.49
Semi-Public place	2172	0	1	.12	.32
Peer accompaniment	2107	0	1	.25	.43

Figure 7.1. Youth crime counts tendency by months.

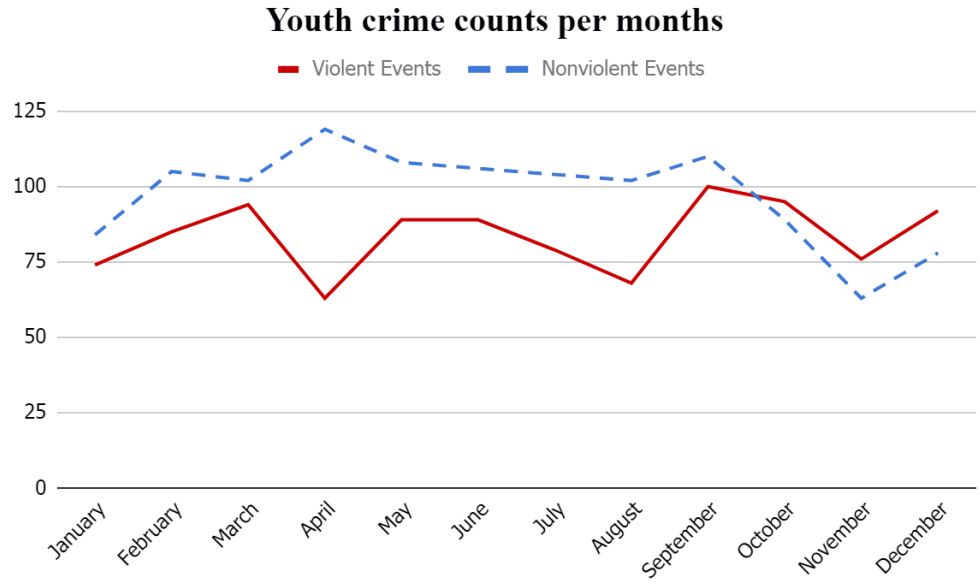
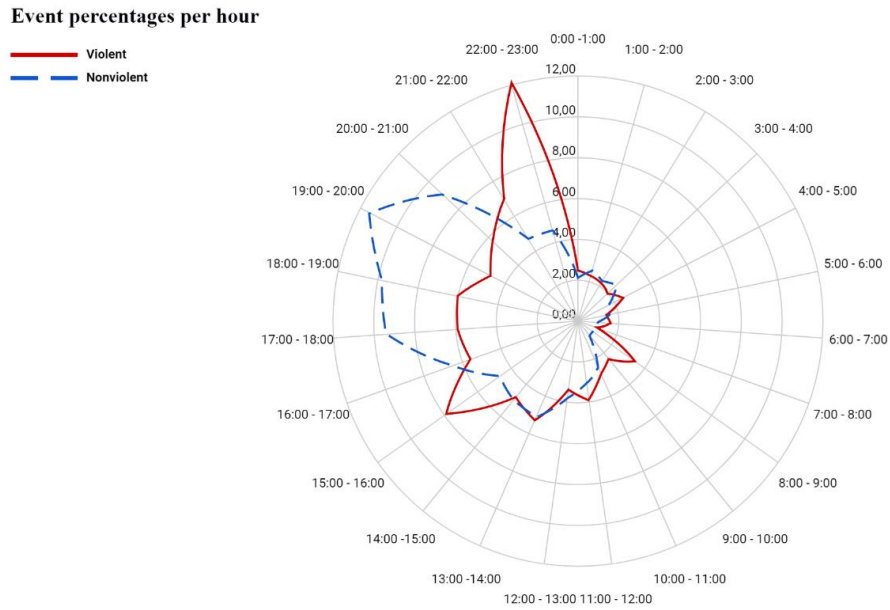


Figure 7.2 represents the time schedule of violent and nonviolent youth offenses by type of crime. It shows that violent offenses tend to happen between 10 p.m. and 11 p.m., coinciding with highest level of darkness; while

nonviolent offenses reach the highest percentage between 7 p.m. and 8 p.m. Depending of the season at this hour of day we will have high (winter) or low (summer) level of darkness.

Figure 7.2. The percentage of youth offenses occurrence by hour.



7.3.2. Seasonality

The results of the one-way ANOVA for the violent events did not show significant differences between violent event means for the seasons ($F(3,362) = 0.42$, $p > .05$). However, the analysis for nonviolent events showed that mean is different in spring and summer in comparison with autumn ($F(3,362) = 5.88$, $p < .001$). Specifically, the *post hoc* Scheffe test ($p < .05$) showed that the average

of the nonviolent offenses by day decrease from 3.70 (spring) and 3.44 (summer) to 2.59 (autumn).

7.3.3. Model estimation

In table 7.2, we present the results of the logistic regression model. The temperature and the rainfall show null association (OR = 1.01 and 1.00 respectively (p > .05)) for youth violent offenses, indicating that nor temperature neither rain have influence in the offenses committed by young people; which is contrary to what we expected. Moreover, non-significant but in the expected direction, weekend (OR = 1.22, p > .05) and public holiday (OR = 1.65, p > .05) showed a positive relationship with youth violent events. On the other hand, and in line with our hypotheses, level of darkness was positive and statistically significant associated to violent offenses. Thus, medium levels of darkness against non-darkness would increase (OR = 1.36, p < .05) the likelihood of a violent event to happen against nonviolent event. In the case of total or almost total darkness against non-darkness, the showed relationship was even stronger (OR = 1.86, p < .001). When talking about the type of place, and contrary to our predictions, public (OR= 0.08, p < .001) or semi-public (OR= 0.12, p < .001) spaces against private places showed a strong negative relationship to violent. Meaning that there is high likelihood of violent offenses to happen in a private space. Finally, offenses committed with peers also showed the opposite results that we have hypothesized, that is a negative relationship to violent offenses. Specially, our result showed an odd ratio of 0.61 (p < .001), meaning that when an offense is committed by a group of minors there is a high probability that is a nonviolent crime.

Table 7.2. Logistic regression model.

	Coef. (SE)	OR	Lower CI	Upper CI
Intercept	1.29 (0.22)	3.63	2.30	5.51
Temperature (ºC)	.01 (0.01)	1.01	0.99	1.03
Rainfall (mm)	.00 (0.00)	1.00	0.99	1.02
Darkness: Medium	.30 (0.14) *	1.36	1.03	1.78
Darkness: Total	.62 (0.14) ***	1.86	1.41	2.46
Public Holiday	.50 (0.27)$^{+}$	1.65	0.97	2.79
Weekend	.20 (0.11) $^{+}$	1.22	0.99	1.52
Place: Public	-2.59 (0.14) ***	0.08	0.06	0.10
Place: Semi-public	-2.10 (0.18) ***	0.12	0.09	0.18
Peer accompaniment	-.49 (0.12)***	0.61	0.48	0.77
Pseudo R^2 (Nagelkerke)		.33		

***p < .001; **p < .01; *p < .05; ^{+}p < .10. Coef. : Regression coefficients; SE: Standard Error; OR: Odds ratios; CI: 95% Confidence interval. Model: $\chi^2(9) = 572.87$, p <.001; -2LL: 2173.65

7.4. Discussion

In the current study, we have explored the association between some environmental and situational variables (meteorology, temporal patterns, type of place and presence of peers) and youth delinquency. First, our results showed that there is seasonality for nonviolent events. Specifically, spring and summer seasons showed in average higher nonviolent offenses than in autumn, while there were not statistical differences among seasons for violent offenses. Second, the temperature and the rainfall depicted a null effect over violent offenses. Third, results regarding the level of darkness showed a positive association and highly significant to violent events. Fourth, weekends and

public holidays showed a positive relation with violent offenses, but it was not statistically significant. Finally, and in relation to the type of place, violent offenses happened in private and being alone more than in public and with peers. Therefore, our results partially support our hypotheses. Only hypothesis 3 -levels of darkness positive related to violent crimes- was fully supported; while hypothesis 1 -crime seasonality- was only confirmed for nonviolent offenses committed by young people; and hypothesis 2 -high temperatures positive related to violent crimes and rainfall negative associated to violent crimes- and 4 -violent crimes positive associated to public and semi-public places- where not supported at all.

The seasons when weather is more pleasant, such as spring or summer, enhance people to participate in more activities outdoors, and seasons that present an adverse weather such, as autumn or winter, could make people stay at home, as contact/avoidance hypothesis proposes (Rotton & Cohn, 2000). In this sense, from the routine activity perspective (Cohen & Felson, 1979), favourable meteorological conditions could enhance the convergence of potential youth offenders and potential victims or target in a specific space. This could be true for our findings of nonviolent events that show higher average during spring and summer seasons. In contrast, our findings for violent events committed by young people differ from previous findings (e.g. Breetzke & Cohn, 2012; Ceccato, 2005). Those results partially support hypothesis 1, showing a kind of seasonality for nonviolent events but not for violent events. A plausible explanation could be the amount of violent offenses that usually happen in private places, such as home, for our sample. Most of those offenses -intimate violence partner or domestic violence (N= 498)- would not depend on seasonal changes. Another possible explanation could be that violent crimes need a higher transgressor conviction than no-violent crimes. Therefore, violent offenses could be less influenced by peripheral variables, such as meteorological ones.

Although the lack of relation between temperature and youth delinquency that we found is in line to previous research (Tompson & Bowers, 2013), there are also recent studies that show dependency of aggressive offenses on temperature (Towers et al., 2018). Younan et al. (2018) also found that aggressive behaviour among adolescents increases when temperatures rise, but this behaviour is not necessary related to delinquency. The authors suggest that the specificity of the temperature aggression association does not have to affect other externalisation behaviours, such as delinquency. Thus, further research is needed in order to clarify relationship between temperature-aggressive and delinquent behaviour. Moreover, rainfall was expected to decrease violent crimes considering the assumptions of the RAT that unpleasant meteorology would make people to have less contact with others, and therefore less opportunity to offend. The found null association depicts something else. A possible reason for the null effect of both temperature and rainfall could be the meteorological conditions of the region and its influence in the way that youth people in the Basque Country spend their leisure time. The Basque Country is one of the regions of Spain with more rainy days along the year according to the Spanish Weather Agency (Agencia Estatal de Meteorlogía, 2019), and therefore Basque youths have found alternatives to spend their leisure time out of home despite the weather conditions, such as share a rented local with peers.

Our results also confirmed the positive relationship of the level of darkness and violent offenses previously found (Tompson & Bowers, 2013). This association is undoubtedly related to the timing where the most violent offenses committed by youth happen. Thus, knowing that high and medium levels of darkness where codify for hours in the evening, we can infer that most of the violent misbehaviours happen in the hours after school. Additionally, as Tompson and Bowers (2013) pointed out, high levels of darkness might limit the function of guardians, as well as, enhance the anonymity perception for the potential offenders. More, we cannot forget that the darkness is an important

element to consider when planning the *modus operandi*. Actually, the Spanish Criminal Code can consider the darkness as aggravating element.

The type of places and the company when offending, although contrary to our hypothesis, can shed some light to the pattern that young people follow when offending. Thus, violent offenses tend to be committed in private places, without company, and in the evening; which can be explained by the high number of offenses of our sample classified as intimate violence partner and domestic violence, that often happen in residences. Nonviolent offenses, meanwhile, seem to happen in public or semi-public places, in company of others peers and in the afternoon hours. Those results can be, somehow, understood by premises of the routine activity theory. Concretely, Felson (2017) highlights that youths' hanging out activity can lead them into criminal situations that were not planned; which goes along the line with the findings that relate unstructured socialising with peers without supervision and youth delinquency (Bernasco, Bruinsma, et al., 2013; Osgood & Anderson, 2004).

We should also mention the positive direction, although non-significant, of the relation between weekend and public holidays and youth delinquency. As previously mentioned, leisure time has been considered as a robust predictor when examining youth delinquency (Tanner et al., 2015), but we also found that a number of violent offenses happened in a private settings, and it could be the case that youths spends more time in private spaces such as residences in non-school days. That type of offenses could be explained considering the situational precipitators proposed by Wortley (2017): some offenses could be committed by *provoked offenders*, that would be reacting to the circumstances -such as irritation or situational frustration- in an aggressive way. We cannot forget, of course, the plausible lack of self-control -which has been robustly established as youth violent delinquency predictor- or other individual factors to explain the violent behaviour, but it is necessary to understand that, as Wortley (2017) points out, a reaction must be preceded by a precipitator.

We should acknowledge some limitations of our study. First, we only used police records to measure youth delinquency, and it is known that police data is not gathered with research purposes and therefore some information that could be interesting for the study of delinquency behaviour is lacking. Additionally, and as the literature has repeatedly pointed out, police data can only provide information about those reported offenses, leaving behind the events that have not been officially known. Future studies could combine police data with self-reported surveys and semi-structured interviews in order to compile more information about the specific situation when and where the offence happened and to know more about the reasons why youths decided to offend under some conditions or others. Another limitation is that we have measured the level of natural darkness, but not the artificial light. Future research could systematically analyses the level of darkness and other spatial features of the places where youth have offended using fieldwork tools recently developed (for example Ceccato, 2019).

Despite the limitations mentioned above and the restrictions to infer causal relationship due to the type of the study, we believe that our research contributes to the current literature showing the implication that environmental and situational variables might have on juvenile delinquency. Moreover, our study offers ideas for future research and some practical implications. Our results point out to the importance of public places and presence of peers for nonviolent delinquency among youths. As previously mentioned, future studies could examine the specific characteristics of those public spaces where youths gather and offend. Additionally, local authorities could enhance the formal and informal surveillance in order to deter youth to offend. Previous research has shown a decrease in some properties crimes when police has indirectly –using posters in high crime concentration areas- let offenders known that neighbours reports actively any misbehaviour (Nussio & Norza Céspedes, 2018). Moreover, knowing that natural darkness is positive related to violent youth delinquency,

local authorities could reinforce lighting and visibility where needed. As a final thought, we should say that some of our findings support previous literature while others fail to do so; however, we must acknowledge that considering the situational nature of the explored variables, research in other context might show different results, and these specificities can be key for designing crime prevention measures adapted to each context. For this reason, replication is needed in order to validate patterns for different countries and areas.

8.
CONCLUSIONS

The general objective of this thesis has been to deepen the analysis of the criminal behaviour of minors from a situational perspective and from the so-called theories of opportunity. This objective does not lead to a better understanding of the phenomenon of juvenile delinquency, but rather aims to lay the foundations for more effective situational prevention strategies adapted to our social and cultural context.

Indeed, several authors argue that the future of the study of criminal behaviour involves analysing the interaction between people's propensity to crime and the situational elements conducive to the occurrence of the criminal act (Cullen, 2011; Wikström, 2004; Wikström, Cullen, & Wilcox, 2010). In this sense, we consider that the results presented in this thesis shed light on the role played by situational elements, such as certain facilities and services or climatic and temporal variables in the appearance of criminal events.

The following sections summarise the key results found in relation to the situational variables that have been considered, which serve as the basis for a series of proposals for future research, as well as a deeper reflection on the practical implications that may be derived from the results.

8.1. Summary of the main findings from a "multi-level" situational juvenile delinquency perspective

When presenting the most relevant results found in this thesis, we will order them according to the different levels at which the different situational variables taken into account in this work could be classified: specifically, we refer to the *socioeconomic setting*, the *built setting* and the *environment setting*.

8.1.1. Socioeconomic setting

The socioeconomic and community context acquires great importance in the aetiology of antisocial behaviour. The literature on this subject has pointed out, for example, that social disadvantages may be indirectly associated with juvenile delinquency, impacting other more direct cases, such as propensity to crime or criminogenic exposure (Schepers, 2017; Wikström & Treiber, 2016); or that higher population density may increase criminal opportunities (Ackerman & Rossmo, 2015).

In this regard, in general, the variables of the socioeconomic environment have not been relevant for the settings of juvenile delinquency in our environment - with the exception of the population size at municipal level. This is confirmed by the lack of association between social disadvantage and the juvenile delinquency rate or the distance that young people travel to the crime scene. This is also confirmed by the absence of a relationship between the lack of informal control - percentage of single-parent families and residential instability - with juvenile delinquency at the municipal level. That is, it seems that adolescents do not take into account the level of disadvantages that exist in the environment when they commit an infraction, nor the lack of informal social control -at least as it has been operationalized in this work. These results focus the current discussion on the relevance of social disadvantages and social cohesion in the study of crime in Europe. We have to bear in mind that, mainly, the conceptualization of social disadvantages and social cohesion in

neighbourhoods comes from the USA context (Sampson et al., 1997; Shaw & McKay, 1942); a country that differs widely with Europe in the social and physical construction of neighbourhoods and cities (Pauwels, Bruinsma, Weerman, Wim, & Bernasco, 2018). Thus, in Europe, most studies suggest that poverty would be more related to the crime rate than to the crime events themselves (Pauwels et al. 2018). This may be in line with the idea that social disadvantage influences crime propensity (see for example Wikström & Treiber, 2016). In Spain, this hypothesis might make sense in view of the latest results of ISRD-3 (International Study of Self-Reported Crime). They show an increase in offences committed by adolescents from more disadvantaged families (Fernández-Molina and Bartolomé Gutierrez, 2018). In any case, we would have to go deeper into this relationship to be able to state that this hypothesis is confirmed in our context.

Our results on informal social control suggest that the type of operationalisation may not be appropriate for our environment. After all, as mentioned above (chapter 3), the configuration of the welfare state in southern European countries means that the family has a very important protective role (Moreno, 2001). In addition, the high social protection provided by the autonomous government (Herrero-Alcalde & Tránchez-Martín, 2017; Peña-Longobardo et al., 2016), would also act as a protective element against the most disadvantaged families.

As an exception, it is worth noting the positive relationship that population size has had with the juvenile delinquency rate at the municipal level. This makes sense if we put it in the context of opportunity. That is, adolescents offend more where there is a greater opportunity to find victims or accessible targets (Cohen and Felson, 1979; Felson, 2017).

We could state, therefore, that in the light of our results the socio-economic scenario does not influence the choice of crime scene - with the

exception of population size. Even so, we should not rule out that the socioeconomic environment is a variable of interest for the place where young people reside and grow up. On the one hand, because international literature has demonstrated this (Schepers, 2017; Wikström & Treiber, 2016), and on the other, because there are indications in the national literature (Fernández-Molina & Bartolomé Gutiérrez, 2018). With all this, it is necessary to bring up the reflection that Pauwels and collaborators make on the measurement of these variables in the European context: we must advance scientific knowledge by focusing on a more systematic research agenda that allows us to answer a series of research questions based on reliable data (Pauwels et al., 2018).

8.1.2. Built setting

At this level, the architectural variables are relevant, referring especially to the morphology of the city, as well as the nature of the services and facilities present in the various urban settings. By the very nature of the built environment, different patterns of mobility will be more favourable which, in the worst case scenario, will bring together potential victims and individuals motivated to commit crimes in specific enclaves (Cohen & Felson, 1979). In this sense, the literature has identified that places where young people spend more time, such as shopping malls or prosocial places, are those associated with delinquency (Chen et al., 2018; Osborne et al., 2016; Weisburd et al., 2009).

It is important to highlight the need to study the built environment. In the first place, because it partly shapes our cognitive maps; thus shaping our spaces of activity and knowledge through nodes -reference points- and routes (Brantingham & Brantingham, 1993; Vozmediano & San Juan, 2010; Weisburd et al., 2016). Secondly, because spaces create the behavioural settings in which young people interact with the environment. As proposed by disciplines such as Environmental Psychology, space is more than the built environment. In each space, people will behave differently, since specific social dynamics will take

place there, to which people will adapt depending on the situation (Weisburd et al., 2016).

In this context, we have been able to corroborate that there are certain services and facilities that could attract more teenagers to commit some kind of infraction. Partially confirming what has been found in other countries. Thus, the juvenile offences in our sample are concentrated in the most central areas of the city. A place where teenagers are most likely to spend most of their time. This is largely due to the type of social dynamics that occur in these places: leisure areas, shopping areas, sports facilities, etc. In this sense, our results at the meso level -census section- would be in line with this idea. More specifically, we have found that juvenile delinquency at this level is positively related to public transport stations, shops and prosocial places, in line with international evidence in this regard (Bernasco, 2019; Bichler et al., 2014; Weisburd et al., 2009). However, our results show that nightlife places, schools and fast food restaurants are not associated with juvenile delinquency at this level. Results that in principle would be contrary to what was found in other countries (Bernasco, 2019; Groff & Lockwood, 2014; Johnson & Summers, 2015). Although at the macro level -municipality- we did find a positive association for hotel establishments -restaurants, cafeterias, hotels, etc. This highlights the need to study variables at different levels (Pauwels et al., 2018).

Additionally, we were able to observe that the presence of shopping malls or sports facilities makes young people travel shorter distances to commit crimes. On the other hand, the presence of schools or libraries does not seem to influence the movement they make to commit some kind of infraction. Our results also show that violent infractions tend to occur in private places, such as their own homes or other homes, while non-violent infractions occur in the public and semi-public spheres on most occasions.

We could say that, at the municipal level, the effect of hotel establishments not related to leisure risk (see chapter 3) could be indicating that adolescents commit more offences in the more metropolitan areas. Given that these municipalities are those that, in principle, have the highest number of this type of establishments. In fact, when we focus in a more meso, or even micro level, we can see how the effect of this type of facilities loses statistical significance. At these levels our results indicate that, very probably, the behaviour scenarios of adolescents in the Basque Country are concentrated in commercial areas and prosocial places, such as sports facilities. This would match perfectly with the most common type of crime among minors: shoplifting (Fernández-Molina & Bartolomé Gutiérrez, 2018; Fernández-Molina, Bernuz Beneitez, & Bartolomé-Gutiérrez, 2017).

For results that are not in line with those found in other countries, there could be several explanations. For example, with regard to the lack of association between schools and the juvenile delinquency rate: it could be that young people decide to act in other areas knowing that in the surroundings of these schools there is a high probability that there are more guardians -teachers, monitors, parents, etc.-. In this way, as with areas close to their homes, young people would create a safety zone or buffer to avoid recognition (Rossmo, 2000). On the other hand, it is striking not to have found an association between juvenile delinquency rates and risky leisure establishments. Knowing that a high percentage of young people between the ages of 15 and 19 tend to attend this type of establishments (Alonso-Sáez, Berasategi, & Crespo, 2018). In this regard, we can not forget other places of leisure risk that occur in our context: the aforementioned "botellón". The lack of controls in this type of meetings linked to uncontrolled consumption and other environmental factors makes it the ideal setting for antisocial behaviour (Gómez-Fraguela & Cutrín Mosteiro, 2014; Summers, 2009). In addition, we cannot leave aside the so called “lonjas” or locals self-managed by the young people themselves. This phenomenon has

increased in recent years in the Basque Country (Alonso-Sáez et al., 2018; Carbajo-Padilla & Martínez-González, 2013). It is in these locals where the "botellón" is moved to avoid police control due to the anti-botellón laws of many municipalities or regions (Carbajo-Padilla & Martínez-González, 2013; Cortés Tomás, Espejo Tort, & Giménez Costa, 2008). These phenomena could be behind the lack of association between juvenile delinquency and risky leisure establishments in our context. Indeed, infractions that occur near bars or pubs in other countries, in our environment could be occurring in the "botellón" places or in the "lonjas". Although future studies will be necessary to confirm this hypothesis, for the time being, there are no records of those places frequented by young people to "make" botellón, nor of the "lonjas".

In general, we can affirm that the nature of certain facilities and services favour the propitious scenario for young people to commit infractions. More specifically, commercial areas and public transport stations are places of reference for many people. In addition, both places are spaces with a prominent flow of people for most of the time. Characteristics that would be favoring the confluence in space and time of victims and perpetrators (Brantingham et al., 2017; Felson, 2017). We can also say that areas with sports facilities - such as skateparks or basketball courts - could be places where young people usually stay to spend their leisure time doing "nothing". That is, socialising unstructured and unsupervised; variable repeatedly associated directly and indirectly with juvenile delinquency (Trinidad, Vozmediano, & San-Juan, 2018). Finally, we see the need to investigate further those facilities and services that have shown unexpected results - schools and places of leisure at risk - since new forms of operationalisation of these variables could emerge for our environment.

8.1.3. Environment setting

In regard to the environment settings, climatological variables, temporal variables or variables of the environment in general are considered. It is evident

that these variables influence people's daily activities (Cohen & Felson, 1979), for example, on rainy days we carry out more activities in closed spaces. On the other hand, these variables could also act as situational precipitators of crime (Wortley, 2017). For example, they could have influence at a physiological level and act as *triggers* (Campoy-Torrente & Summers, 2015; Wortley, 2017): high temperatures have been associated with increased stress and aggressiveness, due to increased production of adrenaline and testosterone (Al-Hadramy and Ali, 1989; Andersson et al., 2003). Or facilitating *anonymity* (Campoy-Torrente & Summers, 2015; Wortley, 2017): evidence in this regard has shown, in short, that there is a positive association between the level of darkness and violent crime (Tompson & Bowers, 2013).

In this sense, we have shown how young people commit more property crimes in the spring and summer. Results that would coincide with the theory of everyday activities (Cohen & Felson, 1979; Felson, 2017). It is in these periods of the year when presumably the weather is better and we tend to do more activities outdoors, and it is in this time that young people enjoy more vacation periods so that increases the likelihood that offenders and suitable victims converge in a specific space and time. However, as far as violent crimes are concerned, we have not found significant differences between seasons. More climatic variables, such as rain or temperature, have also not shown any association with violent or non-violent crime. In this respect we could say that the place where young people spend a large part of their leisure time could be behind these results. The Autonomous Community of the Basque Country is generally a place where rainfall is a constant throughout the year (see graphs of annual rainfall in Euskalmet[11]). Bearing this in mind, young people could choose, in order to spend their leisure time, for places where they would not have to worry about weather adversities. That is, the aforementioned "lonjas" - locals self-managed by themselves- or shopping centres.

11 http://www.euskalmet.euskadi.eus/s07-5853x/es/contenidos/informacion/cli_2015/es_clieus/es_2015.html

In addition, we have also been able to see that there is a positive relationship between violent crime and levels of natural darkness throughout the day, confirming the evidence found in other contexts (Tompson & Bowers, 2013). In addition, these results would go along with the fact that a large part of the violent crimes in our sample occur between 22:00 and 23:00. Also, we have been able to see that there is an association between violent crimes and that the place where they are committed is the private sphere. A result that is not surprising, knowing that many of the crimes in our sample correspond to crimes committed in the private sphere - gender or philoparental violence. In this sense, various explanations could be given for violent conduct late at night and at home. As mentioned earlier, situational precipitators could be one of them. If one thing is clear in juvenile delinquency it is that lack of self-control is something that characterises many of the young offenders. In this way, some situations in the home could act as provocative elements, causing stress on the person, which would lead the adolescent to act aggressively. Although, it would be necessary to go deeper into this phenomenon in our environment, to confirm or deny that there are situational elements that can provoke an aggressive response from young people.

In sum, we could conclude that climate variables do not show any influence on juvenile infractions in our context. Not surprisingly, since in our sample most of the violent infractions occurred in the private sphere. The influence of the climate on violent crime is therefore undermined. On the other hand, among the non-violent events, as we suggested earlier, shopping malls would be places chosen on many occasions by minors to commit crimes. This being so, since it is a closed and acclimated space, it makes sense that meteorological variables have no influence whatsoever. Nor is it surprising that higher levels of darkness are positively associated with violent infractions. Since in these cases, darkness could hinder the visibility of potential guardians (Tompson & Bowers, 2013), creating greater opportunities for young people to

commit crimes without being identified, when we speak of crimes committed in public space; when they occur in private homes, as has been mentioned, the hours of darkness coincide with the time when most people in a convivial unit converge in the dwelling.

8.2. Future research avenues

The present work has also served to draw future lines of research. In this way, we have been able to identify the lack of replication at an international level and consolidate the evidence found. In addition, we have been able to observe that there are essential concepts of some theories that need further study: for example, the role of the guardian or situational precipitators.

In this sense, our results have indicated that certain facilities have not shown the expected relationship with juvenile delinquency; educational centres or nightlife establishments, among others. Thus, future work in the Spanish context should go deeper into the type of leisure of young people and the places where it occurs. Knowing that among young people the "botellón" is a phenomenon of risk and not so much the bars or pubs, we could go deeper into the situational elements surrounding this phenomenon: situational precipitators, absence of guardians, meeting places, schedules, etc. In addition, and specifically in the Autonomous Community of the Basque Country, the role of youth "lonjas" in the antisocial or pro-social behaviour of young people could be explored in greater depth. The increase in this type of locals could be acting as a disturbing element in many neighbourhoods. But it could also have a protective function: for example, in the face of the closure of shops in the neighbourhoods, more eyes in the streets.

On the other hand, once the hotspots of offences have been identified, it would be advisable for future investigations to carry out field studies. Using ecometric tools for systematic social observations (see for example Langton &

Steenbeek, 2017). In such cases, increasingly developed technologies, such as Google Street View, could be used to reduce the costs of such investigations. Several authors have obtained acceptable values of reliability and validity using virtual tools in other countries (Langton & Steenbeek, 2017; Odgers, Caspi, Bates, Sampson, & Moffitt, 2012).

Finally, it would be interesting to explore the characteristics that make a person act as a guardian (Cohen & Felson, 1979). To date, few studies have worked on this concept (Moir, Hart, Reynald, & Stewart, 2019; Reynald & Moir, 2018). In this sense, it would be necessary to identify which individual and situational factors are behind the people who are willing to intervene.

8.3. Limitations

It is necessary to mention the limitations that the present work may have. In the first place, the data would be one of the major limitations of the present thesis. On the one hand, it must be borne in mind that police data do not always reflect the reality of crime, but rather an institutional response to it. This means that we may find ourselves faced with an important bias.

With regard to the loss of data at the meso level - a census unit - we must say that the police data were not geocoded. In many cases, only the municipality appeared, but not the street. For this reason, and maintaining a fairly conservative position, we geolocated only those events that we had the street and the number of the portal or, failing that, some situational element that would allow us to identify the place of the event -supermarket, shop or other type of unique installation on the street.

It is also necessary to comment on the absence of literature in Spanish in the systematic review of chapter 2. In this case one of the main reasons is the scarcity of studies in Spanish in the databases that were delimited to search in

Spanish -WOS and PsycINFO. On the other hand, and as already mentioned, the literature on juvenile delinquency from a situational perspective is rather scarce.

In addition, it should be mentioned that in the studies presented the data on criminal events committed by minors covered a temporary period (2010-2015). While the data collected for the predictor variables, in many cases, corresponded to a single year. In this case, it should be said that we tried to choose those predictor variables that varied less over time, together with those that were essential for carrying out the study.

Finally, as for the predictor variables, we must also comment that they were chosen taking into account international literature. This means that their composition often includes concepts -such as social disadvantages, informal control, or criminal opportunity- linked to theories developed in the U.S.A. Faced with this limitation, we must say that one of the objectives of this work, precisely, was to explore and investigate whether the concepts and forms of operationalisation that literature supposes as global also have a place in our context.

8.4. Practical implications

Finally, we must say that despite the limitations that this work may have, this thesis has contributed to current literature in different ways. On the one hand, it has deepened the phenomenon of juvenile delinquency from the situational perspective at different levels of analysis and considering classic concepts in new contexts; a space that remained to be covered in the literature and that is essential to be able to continue advancing in the search for new methodologies and the development of new concepts. On the other hand, future lines of work have been pointed out that will make it possible to go deeper not only into the phenomenon of juvenile delinquency, but also into delinquency in general and the ways to prevent it.

As for the practical implications that can be derived from this work we can say that it could intervene in matters of citizen security, and in social policies or urbanism. In this way, both local administrations and citizens would benefit. Thus, with the results found in this thesis it would be possible:

a) Reinforce security or surveillance with more patrols in the hotspots. A measure that despite being the most traditional, has shown to reduce crime at these points (Braga, Papachristos, & Hureau, 2012). Even so, it could have side-effects: for example, the increased perception of insecurity by citizens in the face of a greater police presence.
b) Create community support police units in the style of other European countries - the United Kingdom, the Netherlands or France - or some localities in Spain (Guillén, 2016). These would have limited functions, but could: tackle small problems at community level; act as guardians in the hotspots; and, in addition, strengthen the confidence of neighbours in the police.
c) Build spaces that favor the natural surveillance of the community over young people. This would prevent young people from participating in risky activities - for example, the "botellón".
d) Promote community programmes that strengthen social cohesion in neighbourhoods and relations between the administration and neighbourhoods. In this way, by involving civil society, it will be possible to raise awareness among neighbours. After all, the reduction of juvenile delinquency cannot be left to the government alone, but all actors in society must participate.

In sum, we must be aware of the complexity involved in the study of juvenile delinquent behaviour. Not only because it is a polyhedral phenomenon, but also because of the difficulty involved in studying young people who

commit crimes. In this sense, it is necessary to emphasize the need to continue deepening the study of criminal events from a situational perspective, particularly with methodologies and strategies that allow researchers to approach this reality in a more objective and observable way, thus complementing the results obtained with more classic sources and strategies, such as police data or self-report surveys. A multi-method perspective that complements these more classical avenues, for example, with systematic social observation, could serve to achieve a deeper and more nuanced understanding of juvenile delinquency. All this with the ultimate aim of improving the quality of life of the population; building safer and more inclusive cities; and collaterally influencing economic development and the improvement of the social capital of cities.

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ANEXO I

Contribuciones asociadas a los capítulos:

Capítulo 2:

Trinidad, A., Vozmediano, L., & San-Juan, C. (2018). Environmental factors in juvenile delinquecy: A systematic review of the situational perspectives' literature. *Crime Psychology Review, 4*(1), 45-71. doi 10.1080/23744006.2019.1591693

Capítulo 3:

Trinidad, A., Vozmediano, L., & San-Juan, C. (En revisión). "Jumping at the opportunity": the role of situational and opportunity factor son juvenile delinquency in Southern Europe. *International Journal of Law, Crime and Justice.*

Capítulo 4:

Trinidad, A., San-Juan, C., & Vozmediano, L. (2019). Escenarios de delincuencia juvenil en el ámbito urbano: una perspectiva situacional. *Revista Criminalidad, 61*(2): 9-24.

Capítulo 5:

"Giving sense to the place": assessing the relationship between facilities and juvenile delinquency. (Pendiente de enviar).

Capítulo 6:

Trinidad, A., Vozmediano, L., San-Juan, C., & Ocáriz, E. (En revisión). "Taking a walk on the wild side": exploring juveniles' residence-to-crime. *Crime & Delinquency.*

Capítulo 7:

Trinidad, A., San-Juan, C., & Vozmediano, L. (En revisión). "Environmental conditions in youth delinquency events: A temporal, meteorological and situational perspective. *Environment and Behavior*.

ANEXO II

Resumen de la Tesis requerido en la Normativa de Gestión de las Enseñanzas de Doctorado

Introducción

La Psicología, junto a otras disciplinas como la Sociología o Criminología, ha intentado dar respuesta a la etiología de la conducta delictiva. En este afán, son diferentes las perspectivas y las teorías que han surgido tratando de dar una explicación a este fenómeno. Esta diversidad es comprensible, ya que la conducta criminal no es un fenómeno monolítico que se pueda abordar desde una única perspectiva. La complejidad inherente a esta conducta, sugiere la necesidad de tener en cuenta un modelo integral para explicar, predecir y a su vez prevenir los comportamientos ilícitos (Vozmediano & San Juan, 2010).

Redondo (2008, 2015) planteó un modelo tridimensional con el que trataba de dar una explicación más completa de la conducta antisocial e infractora, integrando conceptos y niveles de análisis que han ido aportando las distintas teorías explicativas de esta conducta. En este sentido, el modelo propone tres fuentes en virtud de las cuales se organizan las variables que originarían los comportamientos infractores: *individual*, *social* y *situacional*. Esta última fuente, en comparación con las dos primeras, ha sido tradicionalmente menos considerada, tanto por la Psicología como por la Criminología.

Desde una perspectiva ambiental, las teorías situacionales tienen como objetivo el análisis y compresión del papel que puede jugar el contexto, la situación o el escenario de conducta en la comisión de hechos delictivos (Bernasco, Ruiter, Bruinsma, Pauwels, & Weerman, 2013; Wikström, Ceccato, Hardie, & Treiber, 2010; Wikström, Cullen, & Wilcox, 2010).

Dentro de este enfoque, podríamos diferenciar entre distintas perspectivas. Por un lado, la teoría que Cornish y Clarke (1986) propusieron sobre la *Elección Racional*. La misma plantea que la mayoría de las conductas delictivas implican un análisis previo de costes-beneficios, que los delincuentes realizan antes de la acción ilícita. Por lo que, no solo será necesario la existencia de un infractor motivado, sino que los elementos contextuales como las oportunidades sean las apropiadas para que el individuo considere factible la comisión del delito, o por el contrario, desista de la comisión (Cornish & Clarke, 2008).

De la mano de Cohen y Felson (1979), encontramos la teoría de las *Actividades Rutinarias* (RAT por sus siglas en inglés Routine Activity Theory), la cual propone por un lado, que las actividades rutinarias de las personas ocasionan diferentes oportunidades, y por otro lado, que los individuos cometen hechos delictivos en base a ciertas situaciones, es decir las oportunidades (Felson & Boba, 2009).

Brantingham y Brantingham, (1981), propusieron la teoría del *Patrón Delictivo*. La misma plantea que los delincuentes, con el tiempo y la experiencia, podrán identificar automáticamente ciertas señales asociadas a sus objetivos. Los patrones de los infractores junto con los patrones de las víctimas, hacen comprender que los delitos no ocurren de manera aleatoria y en un espacio elegido al azar (Brantingham & Brantingham, 2008). Los nodos (puntos de referencia), junto con las rutas que las personas utilizan a diario, crean el espacio de actividad de las mismas. En el momento en el que la oportunidad lo permita y el infractor vea un objetivo accesible será cuando se producirá el evento delictivo. Brantingham y Brantingham (1981), propusieron la clasificación de los espacios teniendo en cuenta sus características: *generadores, atrayentes y neutrales*. La clasificación de los espacios no implica que sean contrarios entre sí. Más bien se trata de un compendio de los diferentes

tipos dependiendo la hora y la actividad que ese esté desarrollando en el espacio (Brantingham & Brantingham, 2008).

Finalmente, Wikström (2006, 2015) propuso la Teoría de la Acción Situacional, SAT (por sus siglas en inglés Situational Action Theory). Básicamente, Wikström presenta un modelo en el que los hechos delictivos serán las consecuencias de una toma de decisiones que surgirá de la interacción en un espacio y tiempo determinado, entre la propensión de las personas y la exposición criminógena. La SAT sugiere que las características personales que completan las *propensiones* son la moralidad de las personas (reglas morales de las personas y emociones) y la capacidad de autocontrol. La exposición criminógena, que estará determinada por el ambiente, será la regla moral establecida en el escenario en el que el individuo y los agentes sociales toman parte. La acción será el resultado de la percepción de opciones y la toma de decisiones cuando se confronten con las particularidades de un escenario. Wikström sugiere que estas acciones pueden ser automatizadas o razonadas.

En suma, desde un punto de vista ambiental y situacional, el foco de atención no estará centrado en la motivación del delincuente, sino en la oportunidad para cometer el delito. Teniendo en cuenta esto, y gracias a las diferentes investigaciones llevadas a cabo, se puede saber que muchas de las infracciones cometidas por los menores tienen un alto componente situacional y de oportunidad. Así, gracias a los estudios longitudinales como los de Moffitt (1993) o Farrington, Piquero, y Jennings (2013; Loeber et al., 2015), se han identificado dos tipos de menores infractores: los **persistentes**, caracterizados por la consolidación de una carrera delictiva que alcanza la edad adulta, y los **ocasionales**. Este último conforma el grupo más numerosos de menores que cometen acciones ilícitas y, además, donde se encuentra un mayor volumen de infracciones condicionadas por variables situacionales o contextuales (Loeber et al., 2015; Piquero & Moffitt, 2014).

En relación a los programas de intervención con menores infractores, apuntan a un tamaño del efecto entre r= .07 y r= .13, esto es bajo-moderado (Sánchesz-Meca, & Redondo, 2002; Jolliffe & Farrington, 2009; Piquero, Jennings, & Farrington, 2009). Así mismo, gracias a estos trabajos se sabe que los mejores resultados se obtienen mediante aquellos programas basados en modelos sólidos (habitualmente el más utilizado es el cognitivo conductual). Debido a la naturaleza multinivel propia de la conducta delictiva, se da la circunstancia de tener que incidir en cada uno de los niveles con el objetivo de conseguir una intervención más eficaz. Por ello, y en consonancia con lo concluido por Martínez-Catena y Redondo (2013), el fenómeno de las infracciones cometidas por menores de edad no se puede abarcar únicamente desde los programas de intervención psicológica, sino que para conseguir una reducción más eficaz de las infracciones será necesario incidir en la prevención desde diferentes puntos, entre los que, a la luz del papel mencionado de las variables situacionales o contextuales, bien podemos reivindicar el potencial de la prevención situacional en este rango de edad.

Por tanto, sabiendo que un buen número de las infracciones de menores podrían asociarse a factores ambientales y de la situación concreta (Piquero & Moffitt, 2014; Van Wilsem, 2009), el análisis de los escenarios y circunstancias de las infracciones cometidas por menores proporcionaría la oportunidad de complementar las actuales estrategias de prevención de estos delitos con propuestas de tipo ambiental y situacional. El potencial beneficio de introducir estas nuevas perspectivas es alto, y son especialmente apropiadas para este grupo de edad (Summers, 2009). Pero se trata de un ámbito de trabajo que ha tenido un considerable desarrollo a nivel internacional, mientras que a nivel nacional apenas se ha abordado (San Juan et al., 2015) con alguna notable excepción (Vázquez, Molina, Struse, & Belmonte, 2014).

Así, los menores que podrían incurrir en conductas infractoras, fruto de las circunstancias y oportunidades, tanto como sus potenciales víctimas, se verían beneficiados de la investigación que profundice en estos aspectos y que derive en estrategias preventivas eficaces, evitando a ambos colectivos las consecuencias negativas que sufrirían. No solo con el fin de evitar la victimización, sino además, evitar el coste social, emocional y económico que supone la entrada de un menor en el Sistema de Justicia.

Motivaciones y objetivos

Como se ha mencionada previamente, la delincuencia juvenil es un fenómeno que necesariamente debe ser estudiado desde diversas perspectivas y teniendo en cuenta diferentes niveles de análisis. De esta manera, la literatura científica ha mostrado cómo los factores individuales y sociales de la delincuencia juvenil han sido aquellos que más se han investigado (Medina, 2011b), pero bien es cierto que los factores situacionales han asumido un mayor protagonismo en la última década, como así lo demuestran las investigaciones a nivel internacional.

Sin embargo, y como ocurre en otros ámbitos, la mayoría de esta investigación proviene del contexto anglosajón (Heine, 2010; Medina, 2011a); siendo este tipo de investigaciones en España más bien escasas (ej. Vázquez, Férnadez-Molina, Planells-Struse, & Belmonte, 2014). La universalización de ciertas teorías, como las situacionales, hace que ciertos conceptos, que éstas proponen, se consideren globales sin tener en cuenta los aspectos culturales. Tal y como afirma Medina (2011a), uno de los mayores peligros del etnocentrismo es trasladar las mismas variables utilizadas en un contexto a otro. A pesar de vivir en un entorno globalizado, existen variaciones culturales que pueden tener efecto en la etiología de la delincuencia (Karstedt, 2001). Más aún, teniendo en cuenta que los factores situacionales están relacionados con el diseño urbano, el uso del espacio y con las actividades cotidianas de las personas, y que estas

variables, a su vez, difieren según el país en el que nos encontremos, parece obvia la necesidad de comprobar si los elementos contextuales que han mostrado estar asociados a la delincuencia juvenil en otros contextos lo están en el nuestro. Por eso mismo, la relevancia del presente trabajo radica en la comprobación de hipótesis, bien establecidas en ciertos países, en contextos en los que no se han testado anteriormente.

Teniendo todo lo anterior en cuenta, el presente trabajo tiene como objetivos generales, por un lado, estudiar el fenómeno de la delincuencia juvenil desde una perspectiva situacional a diferentes niveles de análisis. Por otro lado, corroborar si las características socio-económicas y situacionales que en la literatura internacional muestran tener relación con la delincuencia juvenil, se mantienen en el contexto de la presente tesis o si, en cambio, son otras las variables que están asociadas.

Estructura y diseño de los estudios

Para cumplir los objetivos establecidos, en la tesis se presentan diferentes capítulos asociados a los diversos estudios realizados. Así, en el primer capítulo se hace una descripción de la delincuencia juvenil y se presentan los objetivos y estructura de la tesis. A continuación, en el capítulo 2 se recoge una investigación teórica que siguiendo una metodología de revisión sistemática de la literatura de los años 2010-2017 tiene como objetivo específico actualizar el estado de la cuestión del comportamiento antisocial juvenil, recogiendo las investigaciones que tuvieron en cuenta alguna de las principales teorías situacionales.

A partir del capítulo 3, inclusive, se recogen 5 investigaciones empíricas. Siguiendo una metodología no-experimental los diseños de investigación que se han planteado se podrían enmarcar en los estudios de tipo transversal y

predictivos transversales –capítulos 3, 4, 5, 6 y 7. Los estudios se han llevado a cabo utilizando datos policiales para conformar las variables dependientes y datos de fuentes oficiales (por ejemplo, del Instituto Nacional de Estadística o de Eustat) y no oficiales (por ejemplo Open Street Map) pero utilizadas en la literatura científica (ver Malleson y Andresen, 2016), para operacionalizar las variables predictoras. Se pueden diferenciar tres niveles en relación a la unidad de análisis de cada estudio. Así, en el nivel macro –capítulo 3-, la unidad de análisis sería municipal. En el nivel meso –capítulos 4 y 5-, la unidad de análisis serían las secciones censales de la ciudad de Bilbao. En último lugar, el nivel micro –capítulos 6 y 7- comprendería aquellos estudios en los que se ha considerado el evento delictivo.

Para finalizar, en el capítulo 8 se presentan de una manera general los resultados encontrados en cada uno de los estudios, se discuten los mismos desde una perspectiva global, y se finaliza describiendo las dificultades que se han tenido a lo largo de la tesis y proponiendo futuras líneas de investigación para la etapa postdoctoral.

Más específicamente, en el capítulo 3, se planteó un estudio de los municipios de la CAPV sobre la delincuencia juvenil y las variables predictoras que, según la literatura, pertenecen a la oportunidad delictiva -establecimientos de ocio de riesgo (ej. bares, discotecas o pubs); y establecimientos de ocio que no supondría un riesgo (ej. Restaurantes, cafeterías, hoteles, etc)- y aquellas variables que dificultan el control social informal -% de familias monoparentales e inestabilidad residencial-. El objetivo específico para este estudio fue estudiar la asociación entre variables situacionales y de la oportunidad y las infracciones juveniles.

En el capítulo 4, los objetivos específicos fueron explorar la concentración en el espacio de las infracciones violentas y no violentas e identificar las instalaciones y servicios que más se dan en los *hotspots* de infracciones violentas y no violentas. Para ello, se utilizó una unidad de análisis más pequeña -sección censal-. Para así estudiar la concentración de los eventos delictivos cometidos por las personas menores de edad en una ciudad (Bilbao). Se realizaron los análisis espaciales pertinentes, para obtener los *hotspots* -en este caso se calculó la G* de Getis y Ord-. Se calcularon los *hotspots* de las infracciones violentas, contra la propiedad y de aquellas seccione censales donde ambos tipos de delitos coincidían. Por último, y utilizando un análisis de *buffer* se hizo un recuento de los servicios e instalaciones que existían en cada *hotspots*.

El capítulo 5, se propusieron los siguientes objetivos específicos: por un lado, analizar la relación entre instalaciones y características socio-económicas y la localización de las infracciones juveniles. Y por otro, comparar las características de las secciones censales donde se identificó al menos una infracción, con aquellos lugares donde no se encontró ninguna. Para ello se realizaron análisis espaciales más complejos y se analizaron las diferencias entre las secciones censales en las que no se había registrado ningún tipo de infracción y las que sí. Además, se realizaron modelos de regresión no espaciales -Regresión Negativa Binomial- y espaciales -Regresión Negativa Espacial-. Estos últimos para observar si los resultados de los modelos no espaciales estaban sobre-estimados o subestimados. Además, se calcularon los indicadores espaciales de auto-correlación espacial global y local -estadístico I de Moran local y global-.

En el capítulo 6, se planteó describir la distancia que las personas menores recorren desde su domicilio al lugar del evento delictivo. Otro objetivo específico fue estudiar la asociación entre características ambientales y la

distancia recorrida al lugar del delito. Para ello se recogió información de las personas menores de edad, como lugar de residencia en la fecha de comisión de la infracción y lugar del evento, de las sentencias del 2016. Además, se recogió información de aquellas variables situacionales de interés, como densidad poblacional, estaciones de transporte público, o lugares prosociales. Siguiendo la literatura, se realizaron modelos de regresión que se ajustaran los datos que se disponían.

El último estudio empírico se recoge en el capítulo 7. En este caso los objetivos específicos fueron: explorar si existe estacionalidad en las infracciones violentas y no violentas; analizar si existe asociación entre distintas variables temporales y meteorológicas, y las infracciones violentas y no violentas; y, estudiar si existe relación entre el tipo del lugar donde se produce el evento y las infracciones de tipo violento y no violento. Para ello, se tuvieron en cuenta las variables meteorológicas -temperatura, lluvia y nivel de oscuridad- y las variables temporales -horario y estación-, para estudiar los eventos delictivos cometidos por las personas menores de edad. Se realizaron análisis de comparación de medias y de regresión para explorar las características meteorológicas y temporales asociadas a las infracciones violentas y no violentas.

Resultados principales y conclusiones

Teniendo en cuenta las variables predictores recogidas para cada estudios, éstas se podrían clasificar en diferentes medios: *socioeconómico*, *construidos* y *ambiental*.

Así, y de manera general, se puede afirmar que a la luz de los resultados el escenario socioeconómico no influye en la elección del lugar para cometer el delito –a excepción del tamaño poblacional. Aun así, no debemos descartar que

el medio socioeconómico sea una variable de interés para el lugar donde los jóvenes residen y crecen. Por un lado, porque la literatura internacional así lo ha demostrado (Schepers, 2017; Wikström & Treiber, 2016), y por otro, porque en la literatura nacional existen indicios (Fernández-Molina & Bartolomé Gutiérrez, 2018).

En referencia al medio construido, se puede decir que la naturaleza de ciertas instalaciones y servicios favorecen el escenario propicio para que los jóvenes cometan infracciones. De manera más específica, las áreas comerciales y las estaciones de transporte público son lugares de referencia para muchas personas. Además, ambos lugares son espacios con un flujo prominente de gente durante la mayor parte del tiempo. Características que estarían favoreciendo la confluencia en espacio y tiempo de víctimas y perpetradores (Brantingham et al., 2017; Felson, 2017). También se puede decir que las zonas con instalaciones deportivas –como por ejemplo, skateparks, o canchas de baloncesto- podrían ser lugares en los que, por lo general, las personas jóvenes quedan para pasar su tiempo libre no haciendo "nada". Es decir, socializando de manera desestructurada y sin supervisión; variable repetitivamente asociada de manera directa e indirecta con la delincuencia juvenil (Trinidad, Vozmediano, & San-Juan, 2018). Finalmente, se ve la necesidad de investigar más en profundidad sobre aquellas instalaciones y servicios que han mostrado resultados no esperados –colegios y lugares de ocio de riesgo-, ya que podrían surgir nuevas formas de operacionalización de estas variables para nuestro entorno.

Por último los resultados en el *medio ambiental* sugieren que las variables de tipo climatológico no muestran tener influencia sobre las infracciones juveniles en nuestro contexto. No es de extrañar, puesto que en nuestra muestra la mayoría de las infracciones violentas ocurrieron en el ámbito privado. Dejando sin efecto, por consiguiente, la influencia climatológica sobre los delitos violentos. Por otro lado, entre los eventos no violentos, como se

sugiere en estudios anteriores, los centros comerciales serían lugares elegidos en muchas ocasiones por los menores para delinquir. Siendo esto así, al tratarse de un espacio cerrado y aclimatado, tiene sentido que las variables meteorológicas no tengan influencia alguna. Tampoco sorprende que mayores niveles de oscuridad se asocien positivamente con las infracciones violentas. Puesto que en estos casos, la oscuridad podría dificultar la visibilidad de los potenciales guardianes (Tompson & Bowers, 2013), creando mayores oportunidades para que los puedan cometer delitos sin ser identificados, cuando hablamos de delitos cometidos en el espacio público; cuando ocurren en domicilios privados, las horas de oscuridad coinciden con el horario en que la mayoría de personas de una unidad convivencial coinciden en la vivienda.

Con todo, debemos de ser conscientes de la complejidad que entraña el estudio de la conducta delictiva juvenil. No sólo porque se trate de un fenómeno poliédrico, sino por la dificultad que conlleva el estudio de las personas jóvenes que delinquen. En este sentido, cabe subrayar la necesidad de seguir profundizando en el estudio de los eventos delictivos desde la perspectiva situacional, particularmente con metodologías y estrategias que permitan que las personas investigadoras nos podamos acercar a esta realidad de forma más objetiva y observable, complementando así los resultados obtenidos con fuentes y estrategias más clásicas, como los datos policiales o las encuestas de autoinforme. Una perspectiva multimétodo que complemente esas vías más clásicas, por ejemplo, con la observación social sistemática, podría servir para alcanzar una comprensión más profunda y matizada de la delincuencia juvenil. Todo ello con el fin último de mejorar la calidad de vida de la población; construir ciudades más seguras e inclusivas; y que colateralmente se influya en el desarrollo económico y la mejora del capital social de las ciudades.