Journey to crime: How far does the criminal travel?

Final Report

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Literature Review

Introduction

The path taken to arrive at a suitable place to commit crime, the crime location, is the result of a series of personal choices that is shaped by various aspects of the physical environment. Journey to crime research is an area of environmental criminology that tries to measure several components of the journey: the starting point, the pathway to the crime location, and the direction of the path (Rengert, 2004), with the goal of understanding the relationship between an offender’s geography and decision-making. The mobility choices that an offender makes are predicated upon how the environment is interpreted and perceived, specifically in terms of risk assessment and target selection. Distance to crime research specifically asks how far offenders travel from their home, the presumed starting point, to the chosen criminal setting. In other words, what is it about one specific place that convinces an offender to commit a crime there, over an alternate location? A considerable body of research has consistently found that the distance to crime (DTC) in general is short (Andresen et al., 2014; Canter & Larkin, 1993; Gabor & Gottheil, 1984; Nichols, 1980; Phillips, 1980; Rengert, Piquero & Jones, 1999; Snook, 2004), particularly for violent offences (Ackerman & Rossmo, 2015; Wiles & Costello, 2000). Theories that address how offenders construct opportunities within a spatial context provide pragmatic frameworks to explain criminal decision-making, especially as it pertains to choices of distance.
Theoretical considerations for the journey to crime

Rational choice theory

Environmental criminology can be reduced to a singular theme: the environment plays a crucial role in creating criminally favourable circumstances. The blame is shifted away from the individual to a concept of a ‘general offender’ who operates with an assumed rationality. C. Ray Jeffrey (1977) referred to this idea as situational determinism: the environment creates circumstances to promote illegitimate behaviour in people, who are not inherently criminal. Rooted in Cesare Beccaria (2009) and Jeremy Bentham’s (1996) utilitarian perspectives on criminality, people generally behave according to the pleasure-pain principle: maximizing pleasure and minimizing pain. Thus, criminal decision-making is premised on the idea of rationality; offenders make rational choices based on a low-cost, high-benefit analysis (Clarke & Cornish, 1985). Rational choice theory characterizes people as reasoning decision-makers who process environmental information to identify the choice that maximizes benefits while minimizing costs, all in the service of fulfilling a personal need (Clarke & Cornish, 1985). Thus, a crime occurs when the most appealing choice involves an illegitimate act.

While the appeal of rational choice theory lies in its simplicity, the complexity of offender decision-making is highly intricate. Cornish (1994) later amended the original rational choice perspective to include the concept of the “crime script”: a series of steps, or a check-list, that needs to be fulfilled for an offender to commit a crime. If a step in the series were to be disrupted, the crime will not occur (Cornish, 1994). When an offender decides to commit a crime, it is a decision that is made after the culmination of a optimal
requirements specific to the offender, for a specific location. Thus, the decision to commit crime needs to consider the importance of the geographic context.

The rationality that is central to this theory is grounded in the concept of bounded rationality; people will make the best possible decision within a constrained scope of accessible information (Simon, 1972). In an idyllic situation, people have all the pertinent information to a situation, that would be efficiently and accurately interpreted in a cost-benefit analysis. Realistically, the limits of a person’s knowledge and circumstances place restrictions on decision-making, resulting in imperfect decisions being made under imperfect circumstances (Simon, 1972). People who choose to commit crimes at certain locations after weighing the risks and rewards have undergone subjective analyses before arriving at the decision. Despite being a strongly subjective process, the trend for offenders to commit crimes near their residences suggests there are aspects to decision-making that are not only objective, but also generalizable.

**Principle of least effort**

The principle of least effort proposes an explanation to the short distance traveled by offenders: people will only travel as far as is necessary (Zipf, 1965). Congruent with the principle of least effort is the concept of distance decay, or the inverse spatial relationship between activity (legitimate or otherwise) and distance (Brantingham & Brantingham, 1981). It takes more effort, both financially and temporally, to travel further, meaning offenders are more likely to commit crimes closer to their homes (Brantingham & Brantingham, 1981).
People do not always operate based on the shortest distance to a place, however, as an additional layer of complexity is added through the “average rate of work-expenditure over time” (Zipf, 1965, p.6). The principle is best illustrated with an example: the distance to a desired location may be shortest through a mountain rather than around it, but the amount of work involved with boring a tunnel to create a path through the mountain makes it an unattractive choice (Zipf, 1965). In context of criminal behaviour, the most suitable target for a burglar may be the next-door neighbour, as it would involve the least amount of distance travelled, but the additional work from taking extra precautions to ensure anonymity may not be representative of the least amount of effort. The buffer zone captures the idea that while offenders prefer to commit crimes close to home, they are likely to avoid the area directly around their home, where they have higher chances of being identified, which contributes to higher risks (Brantingham & Brantingham, 1981).

**Routine activities theory**

Routine activities are the “recurrent and prevalent activities which provide for basic population and individual needs, whatever their biological or cultural origins” (Cohen & Felson, 1979, p.593). They are the ordinary, generally non-criminal activities prescribed by an individual’s daily routines, including places of recreation, necessity and employment. Routine activities are important because they emphasize how an offender encounters criminal opportunity through mundane, daily tasks, thus highlighting the overall legitimacy of an offender’s behaviour (Cohen & Felson, 1979). Routine activity patterns can affect the three basic components of a crime: motivated offender, suitable target, and lack of capable guardianship, which must converge in time and space (Cohen & Felson, 1979). During the
commission of people’s daily routine activities, the three elements of a crime will converge, as someone becomes a motivated offender, and another becomes a suitable target. Absence of one of the three elements is sufficient to prevent the crime from occurring (Cohen & Felson, 1979). The motivated offender component is based on the tenets of rational choice theory, as the motivation of the offender is assumed (Hollis et al., 2013). Hence, routine activities theory adds two novel components onto the rational choice perspective: guardianship and target suitability. A capable guardian is a broad category of people whose presence can prevent the crime from occurring (Felson & Cohen, 1980). An offender’s perception of increased guardianship or poor target suitability would sufficiently discourage the offender from choosing to commit their crime, both of which are subjective to the offender within a temporal and spatial context.

**Geometry of crime**

The geometry of crime complements the routine activities perspective by incorporating the concepts of activity space and awareness space in explaining the search patterns of offenders. Routine activities serves to familiarize offenders with their geography, thus building on their awareness space, which also informs them of opportune places to offend (Brantingham & Brantingham, 1981). A crime will occur at a specific location that fits into the offender’s crime template, which makes the offender feel comfortable and safe enough to offend there (Brantingham & Brantingham, 1993). The crime template is a mental aid based on impressions of environmental suitability and risk levels, which can be assessed because of the offender’s familiarity with the area, while taking the environmental backcloth (the dynamic changes the environment undergoes depending on a variety of
factors) into consideration (Brantingham & Brantingham, 1993). The idea of environmental belongingness is apparent in the work of C. Ray Jeffrey (1977) and Oscar Newman (1972), who espoused the idea that there is an inherent insider/outsider dichotomy present in the physical environment. Typically, this will be derived from offenders’ sense of familiarity; if they feel safe and unlikely to be perceived as outsiders, they will be comfortable enough to commit the crime there and assessed risk should be low. The offender’s search is a deliberate process that typically falls within their awareness space, the area proximate to the activity space (Brantingham & Brantingham, 1993). The activity space includes the nodes (places) and pathways (connects nodes) where the offender conducts their legitimate routine activities (Brantingham & Brantingham, 1981). Choosing a target outside of the offender’s awareness space should increase perceived risk, as an unknown or unfamiliar area would impair the offender’s ability to understand the environmental backcloth and relevance of certain environmental cues. The familiarity obtained from awareness space is critical to an offender’s rational decision-making, which is amplified further by the nature of the home as the probable centre of a person’s mobility patterns, making it a place more likely to be understood than any other node (Bernasco, 2010).

While there are logical reasons to commit crimes near the home, crime generators and crime attractors offer two explanations why an offender might travel further. Crime generators are places where crimes are likely to occur, by virtue of the type of place it is, such as malls or parking lots (Brantingham & Brantingham, 1995). The sheer density of people clustered in an area mean there is a greater chance that a motivated offender and suitable target will converge, creating more criminal opportunities. Crime attractors, on the
other hand, are places with a reputation as an optimal place to commit crime, such as red-light districts (Brantingham & Brantingham, 1993). The major difference between the two largely lies with intent: people go to crime attractors to commit crime, while crime generators tend to draw opportunistic crime (Brantingham & Brantingham, 1993). The salience of a crime attractor may invite a motivated offender searching for an appropriate crime site, while a crime generator may have appealed to the offender for non-criminal, recreational reasons. Due to the density of attractive opportunities, however, the offender may be tempted to act illegitimately. The allure of certain crime generators and crime attractors may depend on access to transportation, as the choice to travel further is an additional cost not afforded equally to all offenders. Rural areas may have limited access to transportation, making the effort to travel to crime generators and attractors neither feasible nor worth the extra effort.

**Empirical research on distance to crime**

Some offenders may be convinced to travel further from their home, but according to empirical research, most offenders choose criminal locations close to their residences. This trend makes sense in light of the above theoretical explanations and considering that home is the central node of a person’s activity space: where one starts and ends the day (Bernasco, 2010). Distance to crime research assumes that the starting point of an offender’s journey is at their home, but it is possible for the offender to start their journey from an equally important node instead, such as the workplace. Other than reasons of convenience, research has also shown that offenders have greater knowledge of the area surrounding their home (Canter & Larkin, 1993).
Although research often calculates distance to crime based on the offender’s current residence, few studies have considered the common event of relocating to a new residence in a different place, or the temporal component of awareness space. Moving homes will dramatically alter awareness space as new activity nodes and pathways closer to the new residence will be preferred over old ones (Bernasco, 2010). The temporal component that is inherent in the creation of awareness space will be affected by the move, as awareness space is learned and remembered; older awareness space will attenuate with time, while the newer awareness space becomes more compelling (Bernasco, 2010). The ability to assess environmental cues in the previous awareness space will falter as the more recent awareness space will offer more familiarity and will bolster the offender’s perceived ability to identify appropriate offence locations. Awareness space is a place that must be maintained by relatively frequent visits.

A study in the Hague (Netherlands), found that an offender most prefers to offend in an area where they currently live, and have resided for a relatively long amount of time (at least two years) (Bernasco, 2010). The duration that an offender stayed at a residence appeared to be important, however, as a current but newer residence (less than two years) is not significantly different from a previous, long-term residence where they lived at for longer than two years (Bernasco, 2010). Hence, recency and duration appeared to be interchangeable. The least likely area to be chosen for offending is one where the offender lived at for less than two years and left more than two years ago (short-term, long-ago), but it is still preferred over an area where they have never resided (Bernasco, 2010). This general offending preference for current and previous homes is sustained across crime types (residential burglary, theft from vehicle, robbery and assault), although the effect
that former areas have on the offender are particularly strong for assault compared to the
other crime types (Bernasco, 2010). The specificity of suitable targets of assault may be
more restrictive compared to the other three crime types examined, which are all property
crimes, thus the suitable target pool is likely vaster (Bernasco, 2010). Furthermore, the
proximity of the assault to the offender’s residence suggests that the victim is known to the
offender, and the crime may be domestic in nature (Bernasco, 2010). The preference for
current and previous homes points to the offender’s level of comfort and confidence in
committing crimes in his/her awareness space (Brantingham & Brantingham, 1981).

**Offence types**

The established trend in distance to crime research is that the distances travelled by
offenders in general are short, particularly for violent offences (Andresen, Frank, & Felson,
2014; Hesseling, 1992; Tita & Griffiths, 2005; Townsley et al., 2015). Research that first
launched this long-established finding began with White (1932), who measured the
average distance from an offender’s home to the criminal event location in Marion County,
Minneapolis. The study compared the average travel distances for violent crimes (rape,
assault, manslaughter) compared to property crimes (theft of vehicle, robbery, burglary);
offenders travelled 0.84 miles on average for violent crimes against person, while they
travelled approximately twice as far (1.72 miles) to commit property crimes (White, 1932).

Ackerman and Rossmo (2015) found that in general, violent crimes had shorter
median distance to crimes than property crimes (4.2 miles and 5.7 miles, respectively); this
was found despite the study having purposely excluded all offenses occurring in the
offender’s home and family violence offences, as they wanted to capture true ‘mobility’, and
it was reasoned that family offences likely occurred inside the offender’s home. Of the violent crimes, rape, aggravated assault, and murder had the shortest median distances, with simple assault having the longest distance to crime (Ackerman & Rossom, 2015). In comparison, residential burglary had the shortest median distance to crime, even compared to all categories of violent offences, while theft had the longest distance (Ackerman & Rossom, 2015).

While the majority of literature confirms the short distance to crime, there are some instances where offenders may behave contrarily to the expected trend. A study on the behaviour of serial rapists (more than two incidences) suggested that offenders will travel further (more than three miles from their home on average) to commit sexual assaults, particularly those with ritualized aspects to their offending, although half of the sample offended at least once within 0.5 miles of their residence (Warren et al., 1998). Hence, there appear to be some perceived benefits or convenience by offending away from the offender’s residence, enough to risk detection.

Conversely, violent offenders are not only travelling short distances to crime, but have been found to be committing violent crimes in their homes. In the study of four years of crimes (2002 to 2006) in British Columbia, the distances to crime for homicides, sexual assaults, aggravated assaults, and assaults, all violent crimes, have first quartile values of 0 km (Andresen et al., 2014). The weakest relationships between age and distance to crime were found in commercial burglary, other burglary, and theft from motor vehicle, which makes sense considering these are types of crimes that require specific targets and opportunities (Andresen et al., 2014). Commercial burglaries cannot occur in a residential
area, and if the offender lives in a suburban neighbourhood far from a commercial strip, they will need to travel further.

The disparity in distance may be explained by the nature of the crime types under study. While the distance to crime has been established as short, it is worthwhile to compare the differences by crime type, because they likely involve distinctive motivations, risks, or targets. Violent crimes primarily involve people, and it could be argued that in property crimes, the victims are secondary. Hence, the choice of the specific person as a target is likely more important, as well as a limiting factor for violence offences than property crimes, where there is likely to be an abundance of valuables, and the specific target is not important. Furthermore, certain crimes require targets only found in specific areas. Distance to crime was negatively related to the percentage of commercial land use areas in a census block group, and a positive relationship was found between distance to crime and vacant or undeveloped land (Ackerman & Rossmo, 2015).

A component of rational choice theory, termed choice-structuring properties, explains why “specific crimes are chosen for specific reasons”; a type of crime that is attractive for one offender may not be for another (Cornish & Clarke, 1986, p. 935). Choice-structuring properties refer to specific aspects of a crime, including (among others) perceived risks, rewards and requirements, that influences an offender to find a particular type of crime attractive over another (Cornish & Clarke, 1986). Hence, it is important to distinguish between crime types when considering distance to crime. Offenders cannot be treated as one homogenous population with similar journeys. By acknowledging differences between offenders, not only in terms of preferred crime types, but also in terms of individual-level and neighbourhood-level characteristics, that the variations in distances
travelled by offenders can be parsed out. Offender demographics will inevitably affect the choices that are available to the offender, which can influence the likelihood of certain crimes being committed at specific places. The age of the offender, for instance, will not only limit what choices are available (especially in terms of transportation) but will also affect the attractiveness of different options.

There has been research that suggests that even within violent offences, and homicides more specifically, a distinction can be made between homicides involving premeditated versus impulsive aggression (Corsaro, Pizarro, & Shafer, 2017). A study of a decade’s worth of solved homicides (1997 to 2007) in Newark, New Jersey considered not only the offender’s residence to the offence location, but the victim’s residence as well (Corsaro et al., 2017). Overall, weak evidence was found to support homicide being a predatory crime involving planned aggression (Corsaro et al., 2017). Only one of the four models, where the offender’s residence was further away and he had to travel to the crime location, which was within 0.25 miles of the victim’s residence (termed ‘offender mobility’) was found to be more likely to involve planned aggression compared to all other homicide types (Corsaro et al., 2017). When the offender travelled to the victim’s home/offence location, it was more deliberate, in contrast to homicides where the victim travelled to the offender’s home/offence location, which was surmised to be a more opportunistic violence (Corsaro et al., 2017). This ‘victim mobility’ model was found to be more likely to involve young, male victims with the presence of alcohol and/or drug use, in stranger disputes (Corsaro et al., 2017) which further supports the notion of an opportunistic, spontaneous aggression. In contrast, the offender mobility model was more likely to involve female victims, occur indoors, and many instances involved ex-domestic partners, suggesting
these may be specifically characterized as domestic-related instances of violence (Corsaro et al., 2017). Planned aggression was not significantly found to be related to geographically proximate homicides (where the offender and victim’s residences and crime location were within 0.25 miles of each other), nor related to geographically removed homicides (where the three locations are more than 0.25 miles apart) (Corsaro et al., 2017). Even within the narrow crime type of homicides, a distinction can be made that draws an explanation for the journey to crime and intent. Homicides can occur, not just by the chance convergence of a motivated offender, suitable target and lack of a capable guardian, but may be entirely deliberate (Corsaro et al., 2017), meaning that the offender’s decision to travel further is a worthwhile cost paid intentionally.

The methodological issues that have been raised in distance to crime research, partially illustrated with the conflicting findings for violent offences, involves the ecological fallacy. While most distance to crime is short, it does not necessarily mean the distance to crime for individual offenders is short (van Koppen & de Keijser, 1997). This ‘nesting’ of crime trips, which is the minimization of variability due to repeated sampling of the same group, specifically has raised concerns within offender typology in terms of first-time and repeat offenders (Smith et al. 2009; Townsley and Sidebottom, 2010), and juvenile offenders (Andresen et al., 2014; Drawve et al., 2015). Smith et al. (2009) examined the nesting effect using burglary data in the United Kingdom and found consistency in the distance of crime trips of offenders; offenders who tended to travel long distances will usually do so repeatedly. These results suggest that the typology of offenders, such as commuters or marauders (Canter & Larkin, 1993), are important when considering an
offender’s mobility patterns. The nesting effect has been discussed and examined in much of the recent literature, which tries to avoid this aggregation bias.

**Age of offenders**

An analysis of the differences between individual offender characteristics, and in particular, age, has found a positive relationship to distance to crime. In general, adolescent offenders travel shorter distances compared to older offenders (Gabor & Gottheil, 1984; Snook, 2004; Warren et al., 1998). This trend is not new, with research as early as 1930 affirming this finding that focuses on adolescent offenders. Lind (1930) examined the delinquency of juveniles in Honolulu and found that juvenile offenders preferred travelling short distances to nearby neighbourhoods. The effect of age on distance to crime was confirmed in Birmingham (U.K.), Brisbane (Australia), and the Hague (Netherlands) (Townsley et al., 2015). While the effect of proximity of an offender’s home to target neighbourhood was positive for offenders of all ages, the effect was stronger for juveniles (defined as those under the legal driving age) than adult burglars (Townsley et al., 2015). The non-linear age effect on distance to crime was confirmed in Dallas, Texas (Ackerman & Rossmo, 2015), despite excluding offences by juveniles under the age of sixteen. The ‘peak’ at which the offender travelled the furthest was age 26, well within the boundary discovered by Andresen, Frank, and Felson (2014).

Snook (2004) confirmed the positive relationship between age and distance to crime; older burglars travel 1.2 km on average further than younger burglars. There appeared to be two types of offenders: the older offender with vehicle access and higher value targets who travel further, and the younger offender with lower value targets who
offend near home (Snook, 2004). Again, this relationship between age and access to a vehicle seems to be central to explaining the positive relationship with distance to crime. Additionally, access to a vehicle could explain the increased profitability as a car would give the offender the ability to transport greater quantities, as well as larger and presumably more valuable targets (Snook, 2004).

Nesting has been a concern that moved beyond crime types, extending into age, and as a result, several studies have avoided aggregating ages into arbitrary age groups. Andresen et al. (2014) in British Columbia has clarified the positive relationship between age and distance to crime by finding that it is not a positive, linear relationship, but rather, the impact of age on the distance to crime is quadratic, with distance to crime being short in adolescence, peaking in young adulthood, and decreasing as the offender ages into adulthood (Andresen et al., 2014); this is a pattern that is reminiscent of the age-crime curve (Hirschi & Gottfredson, 1983). A quadratic relationship was not found for all crime types (absent in homicide and robbery), and the magnitude of the quadratic relationship and ‘peak’ age also varied depending on the crime type (Andresen et al., 2014). In general, median distances for property crimes tended to ‘peak’, or be older at the longest distance travelled (around age 30), compared to violent crimes, which tended to peak earlier (age 20) (Andresen et al., 2014). Although the quadratic relationship is different, it is still consistent with the conclusions of current research. Coupled with the factor of the age of the juvenile offenders, who have limited means of transportation, they have to limit their criminal offending to places they are familiar enough with (consistent with routine activities approach) that they would reasonably believe their risks are low (consistent with rational choice theory), while requiring minimal effort (consistent with principle of least
effort). At the peak offending age, the offender wants to move far enough away from guardians and they have the capability to do so as they gain greater independence, and make friends that expand their awareness space (Andresen et al., 2014). Adults, with greater transportation means and a wider awareness space (Brantingham & Brantingham, 1981) due to their varied routine activities, will be more likely to travel further than adolescents. As the young adult ages further into adulthood, however, the stability and increased responsibilities of adulthood (marriage, children) will limit the amount of available recreational time, thereby decreasing exposure to offending opportunities (Andresen et al., 2014). Eventually, they do not need to travel further to avoid guardians or monitoring, and there is no reason for them to travel further than necessary (Andresen et al., 2014).

Further addressing nesting concerns, a five-year study (2006 to 2011) in Little Rock, Arkansas, examined juveniles separately by specific ages and found an overall positive relationship between age and distance traveled for all crime types, if the 11 year-old category was excluded (Drawve, Walker, & Felson, 2015). The 11 year-old offender category was contrary to the expected positive relationship as it found that median distance traveled was longer for shoplifting and assault, when compared to older offenders (Drawve et al., 2015). While the longer distance may be explained by factors such as their dependence on guardians for transportation, or being on the precipice of changing from middle school to high school, the authors of the study posit that it may be acceptable to exclude them from the analysis as the 11 year-old category was relatively low-incident (29 out of 2738 total juvenile arrests) (Drawve et al., 2015). Despite the anomaly, the 17 year-old offender category still traveled further (3.5 miles) compared to the 11 year-old
category (2.9 miles), so the positive relationship between distance to crime and age still stands (Drawve et al., 2015). As the age of the juvenile increased, the distance travelled became further for residential burglary, curfew/loitering, and larceny, with the largest increase in distance found for curfew (Drawve et al., 2015).

Shoplifting contained the longest median distance traveled by juveniles (2.93 miles) (Drawve et al., 2015), similar to the results found in other research (Costello & Wiles, 2001). This finding makes sense as offenders need to travel to suitable targets, and shoplifting is by definition a crime of stealing from a business, hence it cannot occur unless the offender travels to a business. This is confirmed by hotspot analysis which found that shoplifting hotspots were the second most concentrated, and were primarily located near large retail discount stores, with a few were near fast food restaurants and gas stations (Drawve et al., 2015). Assaults had the second furthest distance travelled (2.24 miles), with the most concentrated hotspots, many being in close proximity to a school (Drawve et al., 2015). Residential burglaries had the shortest distance (0.52 miles) (Drawve et al., 2015), that is possibly a reflection on the layout of the town. If there are enough attractive targets nearby the homes of the offenders, it may not be necessary to travel further.

Because the activity space informs the awareness space, and the criminal location is found within the awareness space (Brantingham & Brantingham, 1981), the legitimate activity nodes of offenders can be used to construct the awareness space to determine where delinquent opportunities may be found. In order to understand more about the activity space of juveniles, Bichler, Christie-Merrall, Sechrest (2011) used self-report data of 2563 juveniles (ages 10 to 17) who were enrolled in a Southern California juvenile diversion program to surmise their travel patterns. This study tried to situate distance to
school, which in this case was also the offence location, as the juvenile participants were all involved in some form of delinquency while at school, within their activity space (Bichler et al., 2011). The median distance to local activity nodes, the places likely to draw youth from more localized, nearby areas, such as fast food restaurants, video stores, and primary places to hang out when not at home or school, was found to be under 2 miles from home (1.52 to 1.92 miles) (Bichler et al., 2011). In comparison, convergence settings, the places likely to attract youth from various neighbourhoods, such as movie theatres and malls were much further, between 5.00 to 7.84 miles (Bichler et al., 2011). The distance to school, or the crime site, fell in between the two types of activity nodes, at 2.40 miles (Bichler et al., 2011).

Similar to other studies, the general trend of increasing distance with age was found with median distance to activity nodes: youth age 10 to 12 traveled 2.4 miles, youth age 13 to 15 traveled 2.7 miles, and youth age 16 or over traveled 3.1 miles away from home (Bichler et al., 2011). Youth living in more isolated neighbourhoods traveled median distances of 5 miles, twice as far as youth living in the core (2.8 miles) or periphery (2.7 miles) neighbourhoods (Bichler et al., 2011). Youth traveling by cars also traveled significantly farther than any other method (public transportation, walking, or otherwise), a relationship that was found to be proportional to the age of the juvenile, but the effect disappeared when transportation method was controlled for, suggesting that distance travelled is accounted for by private vehicle access rather than age (Bichler et al., 2011).

In comparing the findings, there were some conflicts, such as the negative correlation (-0.154) found between residential burglary and median distance travelled for the juvenile offender sample (Drawve et al., 2015). Previous findings by Andresen et al,
(2013) found a positive and significant correlation, while Costello & Wiles (2001) found a positive but non-significant relationship. This further demonstrates the need to separate juveniles into separate categories to examine the differences. The opportunity and risk-reward assessment for a 12 year-old is vastly different from that of a 17 year-old, not only in terms of access to transportation, but also perceived dependence. Juveniles may begin by being dependent on guardians for transportation, but as they age, they will gain access to mass transit, and the ability to drive, which will give them the ultimate ability to expand their awareness space beyond the limits of their parents’ activity nodes or mass transportation hubs. Furthermore, as juveniles accompany their parents on errands and rely on them for transportation, they could be benefiting from their parents’ awareness space, as it becomes incorporated into theirs (Drawve et al., 2015).

The reoccurring finding of vehicle access in the relationship between age and distance to crime repeatedly emphasizes the role of the physical environment. The geographic layout of a city will affect crime patterns, as the dispersion of business districts and entertainment centers will affect how people construct their awareness spaces (Brantingham & Brantingham, 1981). The less dense a city’s vital nodes are, the larger an offender’s awareness space is likely to be, as the offender will have to travel further to access important and popular places, thus increasing the span of the offender’s awareness space, and vice versa (Brantingham & Brantingham, 1981). Hence, the layout of a particular city is important when analyzing an offender’s distance to crime. The larger an offender’s awareness space, the more likely crime attractors will fall within the areas, prompting further travel. The extensiveness of an awareness space may vary depending on some demographic characteristics, such as age, as discussed. As a person ages, they will gain the
ability to drive, which will likely increase their awareness space (Brantingham &
Brantingham, 1993). Mass transit, another means to awareness space extension, makes
previously foreign areas more accessible (Brantingham & Brantingham, 1981). Individual-
level factors, such as age and socioeconomic status, may be limited in their access to
alternate modes of reliable transportation if mass transit is not available. Younger or lower
socioeconomic status offenders may commit crimes closer to their home out of sheer
necessity. Being young or poor are not exclusive characteristics, as both speak to a lack of
means. An offender who is constrained in the area close to their home will be more likely to
be extensively familiar with the area and its intricacies, including hidden paths or
walkways (Brantingham & Brantingham, 1993).

The possibility for suitable targets will expand the search area beyond the main
road into lesser-known areas (Brantingham & Brantingham, 1993). Age and socioeconomic
status may affect the method or pathway that are familiar to an offender, as a pathway for
walking is different from the pathway for driving. Awareness space adapts overtime as new
information is gained from experience and expands to cover greater areas as the offender
becomes more comfortable and has more time to explore the surrounding area
(Brantingham & Brantingham, 1981). Older offenders will have had more time to explore
the area and develop their awareness space. Awareness spaces can also be modified or
enriched by interactions and the exchange of knowledge with other offenders
(Brantingham & Brantingham, 1981). Creating a larger social network with other offenders
may involve sharing knowledge of crime attractors, a function of age and experience. The
older an offender, the more likely they are to gain this spatial knowledge. Thus, it may be
worth distinguishing between offenders not only based on age, but also on repeat/first time offenders.

**Gender of offenders**

Gender is a variable that has largely not found definitive consensus in journey to crime literature, with some research finding that female offenders tended to travel further than male offenders for property crimes involving juveniles (Phillips, 1980), residential burglaries (Hayslett-McCall et al., 2008), and for a variety of crimes (Ackerman & Rossmo, 2015). Males tended to travel shorter distances to crime than females; females typically traveled 0.32 miles further (Ackerman & Rossmo, 2015), or twice as far as male burglars (Hayslett-McCall et al., 2008). Other studies found the opposite: that male offenders travelled further for burglaries (Rengert, 1974), robbery (Nichols, 1980), and homicide (Corsaro et al., 2017; Groff & McEwen, 2006). Hence, there is not a clear trend readily apparent from the literature. Previous studies that established the consensus on the generally short distances to crime and shorter distances for juvenile offenders compared to adult offenders (as previously mentioned) either involved samples that did not separate male from female offenders, or as was more often the case, the sample was simply entirely made of male offenders. Studies that compared male and female offenders in this context is rare, therefore making a pattern difficult to establish.

Some findings, however, suggest differences between male and female offenders. For instance, recent research has found that female burglars tend to be more impulsive than male burglars (Sanders, Kuhns, & Blevins, 2017), meaning gender may be a variable that affects offender mobility. Male offenders may be more likely to travel further to locate
suitable targets that were less risky, whereas female offenders, being more risk-prone as the research suggests, may not want to travel as far to offend.

Another study that examined the effect of gender on assault found differences between the places that women and men choose to offend, as well as the victimology. Pittman and Handy (1964) found that female offenders generally assaulted their victim in a residence (although the study did not specify if it was the offender’s residence), while male offenders tended to assault outside, on a public street. Furthermore, female offenders were more likely to be related to their male victims, and specifically they tended to assault males with whom they were in an intimate relationship with, but the same was not found for male offenders to female victims (Pittman & Handy, 1964). The gender difference may also be explained by the female versus male preference for certain types of crimes (Clarke & Eck, 2003), or the differences in responsibilities (particularly in case of child care) that are typically gendered, thus limiting the time and opportunities for women (Rengert, 2004).

**Target suitability: Neighbourhood affluence**

The distance to crime research can be broadly conceived as examining individual-level characteristics, or neighbourhood-level factors. While age and gender are relatively common individual-level characteristics, a wide range of neighbourhood-level characteristics that try to operationalize risks and rewards have been examined. Target suitability has been addressed in the context of burglaries specifically in several studies. Although burglaries and thefts may derive from non-monetary motivations, they are an inherently financially-centric crime. Hence, they are the most ideal to determine the effect that target suitability and perceived higher rewards has on target selection.
Vandeviver, Van Daele, and Vander Beken (2015) conducted a study that operationalized risks and rewards associated with burglaries by using community characteristics (such as population density, property value, road network density) in a large-scale study in Flanders, Belgium. If traveling further distances from home constitutes a cost, burglars must try to compensate in some other way. Using control variables including age, gender and experience (measured by number of repeat offences captured in the data set), gender was the only control variable that was found to be significant; females were more likely to take longer trips than males (Vandeviver et al., 2015). This relationship ceased to be significant after the risk and reward variables were included, with the strongest relationship being found between population density and distance to crime (Vandeviver et al., 2015). This is contrary to a considerable amount of research that has found significant effects of individual-level characteristics such as age (as discussed previously). The findings suggest that more may be at play between the relationship of age and distance to crime, such as the way burglars rely on environmental characteristics to assess costs and benefits, regardless of their age or gender. Distance was found to have a positive relationship with road network density, and presence of a motorway, while a negative relationship was found for population density and burglary clearance rate (Vandeviver et al., 2015). Contrary to expected findings, property value was not found to be significantly related to distance (Vandeviver et al., 2015). While unexpected, it is possible that burglars expect to profit regardless of the area (Vandeviver et al., 2015), and increased property values could be associated with more target hardening, such as alarm systems.

Similar to the previous study, Townsley et al. (2015) used burglary data to test the spatial preferences of offenders using environmental information to operationalize
expected risks, rewards and effort associated with burglaries. Using a discrete spatial choice model to predict burglars’ preferences in the Hague (Netherlands), Birmingham (the United Kingdom), and Brisbane (Australia), target accessibility (measured by number of single-family dwellings), target availability (number of residential units), and proximity to the offender’s home all positively influenced choosing an area for burglary (Townsley et al., 2015). There were marked differences between each city, however, indicating that the environmental characteristics specific to each city have an effect on how offenders will perceive costs and rewards of the crime trips. While burglars in all three cities preferred to offend in neighbourhoods closer to their home, the preference was stronger in Birmingham and the Hague, with the odds of a neighbourhood being selected increasing by 90% and 67% respectively, for each kilometer closer to an offender’s home (Townsley et al., 2015). In comparison, the odds increased by 21% for Brisbane (Townsley et al., 2015), all of which still support the principle of least effort (Zipf, 1949). The type of neighbourhood that is analyzed (urban, suburban, rural) could affect the offender’s location choice. The tendency of burglars in the Hague and Birmingham to strongly prefer target neighbourhoods proximate to the offender’s home, in comparison to Brisbane, could be attributed to target density difference, as Brisbane had low target density (Townsley et al., 2015). Where spatial density is high, such as it is in Birmingham and the Hague, offenders showed limited search areas, while burglars in Brisbane, may not have the luxury of choice and may be forced to travel further to find suitable targets (Townsley et al., 2015). The negative neighbourhood affluence relationship was found again in the Hague. Higher real estate values (meant to represent neighbourhood affluence) decreased the likelihood of an area
being selected, contrary to expectations (Townsley et al., 2015). Burglars in the Hague may prefer neighbourhoods of lower affluence.

Residential instability, a scaled measure that combined residential mobility and percentage of renters, had a significantly stronger effect than most of the individual-level predictors and all of the other neighbourhood-level predictors (Ackerman & Rossmo, 2015). While this variable did not directly measure affluence in the same way that residential prices or income might have, the components that were used, indirectly measure income. The economic disadvantage variable, another scaled measure that included percentage of people below poverty line, percentage on public assistance, percentage unemployed, percentage of female head of households with children, although not statistically significant, did have a negative relationship, concurrent with existing research (Ackerman & Rossmo, 2015). Population density, a variable meant to reflect target availability, had a significant, negative relationship to distance to crime (Ackerman & Rossmo, 2015), a finding consistent with other research. Overall, neighbourhood-level variables explain more of the distance to crime variance than individual-level variables (Ackerman & Rossmo, 2015).

**Cross-jurisdictional travel**

When offenders choose criminal locations, it is likely they do not construct jurisdictional boundaries as a city planner would. Although this is a severely understudied area of distance to crime research, it is a necessary component to offender mobility. The geometric theory of crime offers the concept of edges to explain the higher crime concentration at edges. Edges are borders where there is a noticeable change as you move from one area to
another; it can be a physical edge (beach bordering ocean), or a perceptual one (houses behind a commercial street) (Brantingham & Brantingham, 1993). Another type of edge is the border between cities. Crime rates are expected to be high at the edges because of the legitimacy accorded to people who might be perceived as an outsider further into the city, where there is a stronger sense of territoriality and standing out in some neighbourhoods (Brantingham & Brantingham, 1993). Contrary evidence relating to the perception of edges was found within Sheffield, where offenders who lived near the border appeared to offend both within Sheffield and outside Sheffield, in its neighbouring cities (Costello & Wiles, 2014), without particular regard for borders. Treating borders as a physical boundary may be dependent on other factors, such as how accessible the area is, or whether it is connected by mass transit. An area such as the Lower Mainland in the Greater Vancouver Regional District, which has a highly interconnected skytrain system blends physical boundaries between several cities on a single transit route.

**Implications of journey to crime research**

While journey to crime contributes to the body of knowledge regarding offender mobility, the end goal of most criminological research is to gain insight into crime, in order to prevent or decrease it in some manner. If the journey to crime is short, as it has consistently been found to be, a program designed to discourage crime might consider increasing the risks and costs of crime, such as forcing potential criminals to travel further. The challenge in this lies in the fact that all people are potential offenders, and their residences have no common location. However, there are areas such as apartment buildings or residential areas that contain a high concentration of people, hence, potential
offenders. Creating obstacles to crime near those areas would not only be consistent with CPTED and CPTUD but would also likely discourage a large concentrated number of potential offenders from committing crimes near their homes. Furthermore, previous offenders could be targeted by creating obstacles and increasing risks near halfway houses or known residences of offenders.

The spatial characteristics of the neighbourhood that the offender resides in is clearly of importance, as the aforementioned research has already demonstrated that where the offender lives can affect where the offender eventually chooses to commit crime. The fact that there is variation in distances travelled based on crime type suggests that the risks, target suitability and availability differ depending on the location. Hence, the environmental characteristics of the offender’s residential neighbourhood and the characteristics of the criminal location warrant further study, with regards to neighbourhood affluence, has not been addressed in the Canadian context. Vancouver, in particular, is a metropolitan city with the highest population density in Canada (as of 2016 Census) and is experiencing massive changes, including a growing population within volatile residential values and continued gentrification of certain areas. Greater density brings more convergence of suitable targets, motivated offenders and lack of capable guardians, as suggested by routine activities approach (Cohen & Felson, 1979). Thus, a city with greater population density would be expected to have more criminal opportunities, and more crime. Understanding how Vancouver’s expansion affects its neighbouring cities as well as the rest of the province in the midst of the current environmental backcloth is a question worth exploring further.
Original research topic and modifications based on OCR-GO consultations

As outlined in the submitted research proposal, the original research questions involved understanding the spatial behaviours of offenders. Specifically, the research was to investigate the impact of the different neighbourhoods offenders came from, their ages, and their gender on their spatial behaviour. In other words, does where an offender live, how old the offender is, and their gender affect how far a criminal will be willing to travel?

Though an interesting research question, particularly from an academic perspective, in a meeting with OCR-GO representatives we discussed how we could alter this original research focus. Though OCR-GO, and police services, were interested in the journey to crime and how it varies by different types of offenders, the resource implications of how offenders travel was of greater interest. Specifically, if an offender travels across police service boundaries they will consume resources from all police services involved. In order to investigate how many offenders travelled across police service boundaries, we agreed to change the research focus for this particular proposal to make the research more applicable to policing, but still provide an interesting research topic for academic outlets.

The resulting research was to identify each offender in the data (PRIME-BC), identify their home address (and corresponding police service at the time of each criminal incident) and the location of the criminal incident; additionally, a data download was to be undertaken each month to account for changes in the home address of offenders. This process was to be repeated for each of their criminal incidents to identify the total number of police services with which their activities are interacting, and then for each offender in
the database. With these new data, we would then identify those offenders who offend across multiple police services, calculate the proportion of those offenders, relative to all offenders, and generate estimates of resource costs for offenders that travel across multiple police services. This would conclude, potentially, with suggestions for strategies to address any redundancies in police service work on these cases, particularly if there are geographical constraints with regard to how far offenders travel.

Unfortunately, due to data access constraints, we were not able to conduct this research. Below, we describe what happened with regard to data access with a suggestion on how to move forward so that this research may be undertaken in the future.

**Data access and the current research**

The road to data access for this research project began with a meeting between OCR-GO representatives and SFU-ICURS researchers (Martin Andresen and Tarah Hodgkinson) shortly after funding had been allocated. The purpose of this meeting was to discuss the nature of the research project/questions and the data necessary to undertake the research. We made a number of alterations to the research proposals to make the funded research more applicable to policing while maintaining academic interest, according to suggestions from both the RCMP and OCR-GO. Everyone was happy with the nature of the modifications and we moved forward with the necessary data.

In order to undertake both research projects, detailed data from PRIME-BC that included event and subject level information was necessary. Despite the level of security in the ICURS laboratory and the security clearance level of the researchers (and willingness to obtain additional clearance where necessary) care still needs to be considered given the
sensitive nature of the data. We derived a list variables we requested to undertake the research that would then be taken to the RCMP for approval of being extracted; a RCMP representative had agreed to download data for the projects from all police services involved, who agreed to this process—more on this below. One particular aspect of data access that was a significant move forward over previous data access in ICURS was to include variables indicating the presence of particular keywords in the text portions of each criminal event: the synopsis. These keywords were to be identified in focus groups with interested police services. After this meeting, we moved forward with getting approval from the Chiefs in the various police services to be involved with these research projects, a necessary component of our being able to obtain ethics approval from SFU to undertake the research.

By the end of August 2018, we had received approval from all police services, less Vancouver to be involved with the research projects and to have the RCMP representative download their data for the research projects. This led to our getting ethics approval from SFU to continue, a necessary component for our being able move forward with the research projects. At this point we were ready for data extraction to be performed by the RCMP and have the data delivered to our secure computing facility that has been approved by the RCMP at the national level privacy impact assessment and threat risk assessment.

Although all parties involved wanted to have all police services in British Columbia a part of these research projects, there was no specific requirement for the Vancouver Police Department (VPD) and we decided to move forward with the research. OCR-GO representatives were hopeful that one of their members would be able to move things forward with the VPD and have this police service involved in the research projects (which
would mean all police services were involved). We were hopeful as well given the significant hole in the data that would be present if VPD was not present. We continued to work on the literature reviews and focus groups (both part of the revised research proposals).

In early October, VPD expressed interest in the project and we placed everything on hold so we could (hopefully) have province-wide research studies in these two areas. As part of this process, MOUs that stipulated protocols for data delivery, use, and publications were developed and sent to all police services for comments. The MOUs (one for each project) were based on MOUs previously signed by the RCMP and the independent police services that operated in the Fraser Health Authority.

Martin Andresen and Tarah Hodgkinson met with VPD to discuss this MOU and their concerns regarding data security/privacy/confidentiality/breaches, responded to a number of email questions from the legal team at VPD, and acted as liaisons between the legal teams at VPD and SFU. These communications continued for months, answering further questions regarding cyber-attacks and data breaches. However, because of our physical, personnel, and server security at SFU, these risks are non-existent or extremely minimal. This was clearly explained on numerous occasions.

Based on our discussions with legal counsel at VPD and with police leaders in BC, we were aware that there were a number of meetings when these MOUs were discussed. Given that we were not invited to these meetings, the other police services (and VPD executives for that matter) did not hear the benefits of research that was not conducted “in house” and present our levels of security that may have eased any concerns. In particular, that despite
some in-house statistical expertise, the opportunity for widespread comparison and academic objectivity around these two research areas.

At the end of the research project timeline (February 2019, with a project end date of March 2019), we were informed via email from Chief Dubord that none of the police services would be involved. As such, VPD had decided to not be involved in the research and also convinced the other police service to revoke their initial agreement to be involved in the OCR-GO research projects. Once this decision had been made, our ethics approval was effectively revoked.

**Suggestions for moving forward with OCR-GO research involving police data**

As stated above, there are benefits to having research undertaken by those not working within police services. First and foremost, there is the independence of the research; this is rooted in academic objectivity. Second, if provided with data from other police services, comparisons across police services can be undertaken very easily. And third, unburdened by operational demands, we can conduct this research without being pulled in other directions that are deemed more important at the time for day-to-day police service provision.

In order to conduct this type of research sensitive police data are necessary. Most often, in order to protect the providers of the data and those receiving the data for research purposes, some form of a research agreement is necessary. We have found that obtaining such an agreement after the research funding has begun delays, and in the current case prevents, research from being conducted. As such, it is our recommendation that OCR-GO
engages into a data sharing agreement with the various police services who wish to be involved with this type of research. This agreement would dictate the conditions upon which must be met in order to release data to researchers. Under such an agreement, OCR-GO would know whom and to which institution they would be able to allocate research funding and have that research begin immediately rather than having research obtain an agreement to conduct the research after the funding has started. This would not only facilitate the research process, but prevent one (or more) police services from bringing ongoing and funded research to a halt.
References


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