Offender and Victim ‘Journey-to-Crime’: Motivational Differences Among Stranger Rapists
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Introduction

Stranger rapes often pose considerable challenges for law enforcement agencies (Beauregard & Martineau, 2017). Among concerns of sexual recidivism and the possibility of the offender escalating in the severity of his actions with subsequent victims, is the added complexity of community pressure that the police often face to identify the suspect. In the absence of physical evidence, eyewitness identification, or a confession that would link the offender directly to the crime, stranger rapes are often the most difficult for law enforcement to solve. Thus, without any other information, investigators often need to look closely at the offender’s crime scene behavior in hopes of answering two questions central to the investigation: (1) why did the offender commit this crime? And, (2) how can this information be used to identify the at-large offender in such cases?

Another feature of the crime that might be helpful to investigators in active stranger rape cases is the geographic mobility associated with the event. One aspect of mobility that has attracted research attention, beginning in the 1930s (e.g., White, 1932) and becoming more popular in the 1970s onwards, is the journey-to-crime. The journey-to-crime typically refers to the direction and amount of distance that either the offender or the victim travel from his/her residence to the crime scene location (Rengert, 2004). While not a new phenomenon, LeBeau (1987b) notes that the literature on ‘journey-to-rape’ is much scarcer than it is for other crime types. The overarching conclusion that emerges from this small literature is that rapists have short crime trips, choosing to offend within only a few miles of their residence in most cases (e.g., Amir, 1971; Block, Galary, & Brice, 2007; Chopin & Caneppele, 2019a, 2019b; Davies & Dale, 1995; LeBeau, 1987b; Rossmo, Davies, & Patrick, 2004; Santtila, Laukkanen, & Zappala, 2007; Santtila, Laukkanen, Zappalà, & Bosco, 2008; Warren, Reboussin, Hazelwood,
Cummings, Gibbs, & Trumbetta, 1998). Although not as well documented, victims of rape have short crime trips as well, with most attacks occurring within close proximity of their residence (Amir, 1971; Block et al., 2007; Ceccato, 2014; Chopin & Caneppele, 2019a). For example, using police data from France, Chopin and Caneppele (2019b) found that more than fifty percent of the victims in their sample were assaulted within 0.75 kilometers of their residence. Although these findings are valuable from an investigative standpoint, it is not yet clear if, and how, the journey-to-crime associated with stranger rape cases varies when analyzed in conjunction with crime scene factors. The goal of this study, then, is to combine crime scene behavior and spatial data in solved rape cases to better understand how such information can be pragmatically applied in police settings.

**Literature Review**

**Theoretical background**

Rational choice theory (Cornish & Clarke, 1986), routine activities theory (Cohen & Felson, 1979), and the geometric theory of crime (Brantingham & Brantingham, 1981) – collectively known as crime pattern theory – provide a framework through which the spatial movements of both offenders and victims can be better understood. Cornish and Clarke (1986) stated that criminal events are deliberate acts whereby individuals make purposeful and rational decisions about whether to participate, and once committed to their execution, how these acts will unfold, including who/what the victim/target will be, and when and where the crime will take place. Central to this perspective is the idea that decision-making, particularly that which is relevant to illegal behavior, is a choice; one that is easily made when the offender believes that the benefits of participation clearly outweigh the costs associated with it (e.g., effort expended, risk of apprehension, subsequent punishment). Within this context, it is possible to better
understand an offender’s decision-making, including why he/she committed the specific type of crime (e.g., rape), and the decisions related to it (e.g., victim type, distance that needs to be traveled to search for him/her), by examining his/her motive.

Decades of research has typified rapists based on their motivations for offending (e.g., Barbaree, Seto, Serin, Amos, & Preston, 1994; Knight & Prentky, 1990). Common among most studies is the finding that rapists generally fall into one of the following motivational subtypes, based on their crime scene behavior: opportunistic, compensatory, sadistic, power/control, and angry. Opportunistic rapists are characterized by very little impulse control and perpetrate predatory acts that are often unplanned (Knight & Prentky, 1990). These offenders do not engage in extreme violence nor aggression during the offense, often using force only as a necessary response to victim resistance to ensure completion of the sexual act. Similarly, compensatory rapists are impulsive and they perpetrate attacks that involve very little aggression (Groth, 1979). However, what truly characterizes these rapists is that they often exhibit poor social skills, doubt their own desirability, and they tend to suffer from extreme feelings of inadequacy (Groth, 1979; Berger, 2000). While they are highly aroused by fantasies of the rape (Cohen, Seghorn, & Calmas, 1969), often their feelings of inadequacy diminish as a result of completing this sexual act (Robertelli & Terry, 2007). Sadistic sexual offenders are motivated to act out violent sexual fantasies on their victims (Groth, 1979). These offenders display a high degree of planning in their offenses and often show little to no remorse for their actions. They may commit several acts of torture that result in severe physical and/or psychological harm of their victims. Power/control rapists are known for exercising strength, authority, and control over their victims in order to assert their masculinity (Douglas, Burgess, Burgess, & Ressler, 2006; Hazelwood & Burgess, 1987). These rapists tend to engage in a moderate amount of physical and verbal abuse during
the sexual attack (Groth, 1979; Hazelwood & Burgess, 1987) that may leave their victims physically, psychologically, and emotionally traumatized. Lastly, angry rapists perpetrate their crimes to express rage or hatred, release anger, or obtain revenge (Groth 1979; Knight & Prentky, 1990; Pardue & Arrigo, 2008). These rapists tend to use extreme violence and force during the commission of their crimes, even if there is no resistance from the victim (Palermo, 2003; Robertiello & Terry, 2007). Thus, given these common motives, most rapists will make a series of decisions both before and during the commission of the crime to ensure that they achieve their desired goal, whichever it may be. Besides motivation, environmental and situational factors can also influence an offender’s criminal decision-making, especially as it pertains to his/her search for victims.

Often, rapists’ geographic behavior is constrained by the availability of ‘suitable’ victims. The value or desirability of the target will, in large part, be determined by the offender’s motive for committing the crime. For example, an opportunistic rapist will judge a potential victim’s desirability based primarily on the situational conditions present at the time that may be conducive to an assault. This contrasts with a sadistic rapist who typically desires victims who possess very specific characteristics. The visibility and accessibility of the victim are likely determined by his/her routine activities, which are affected by temporal and seasonal variations. Thus, the environmental backcloth (see Brantingham & Brantingham, 1993) dictates the activities that take place in any given location, and the offender factors this knowledge into his/her spatial decision-making when searching for victims. The motive for committing the offense, then, combined with the routine activities of both offenders and victims, and where and when they take place, all play a role in the journey-to-crime and to victimization.

**Correlates of crime journeys among extrafamilial rapists and their victims**
In addition to motive and the routine activities of offenders and victims, several offense characteristics influence the journey-to-rape (for a comprehensive review, see Beauregard, Proulx & Rossmo, 2005). For example, LeBeau (1987a) observed a relationship between the offender’s method of approaching his victim and the amount of distance traveled. Offenders who assaulted victims within their own residence were likely to have shorter crime journeys. In terms of victim choice, Duwe, Donnay, and Tewksbury (2008) found that offenders who target stranger victims tended to travel farther to commit their crime than when the victim was previously known to them. Environmental characteristics also play a role in the offender’s journey-to-crime. Studies have found that rapists tend to travel farther distances when rapes occur in the evening or throughout the night, on the weekend, and during the winter months (Ceccato, 2014; Gabor & Gottheil, 1984; Warren et al., 1988). In terms of the spatial aspect, stranger rapists have been found to prefer attack locations close to parks, forested areas, or interstitial places characterized by poor visibility, an easy escape route (Ceccato, 2014), and where the risk of interruption is low (Ceccato, Wiebe, Eshraghi, & Vrotsou, 2017; Quinsey & Upfold, 1985). Furthermore, attacks, specifically those within the inner city, have been found to occur most commonly near alcohol selling outlets, or a licensed restaurant or bar (Ceccato, 2014; Ceccato, Li, & Haining, 2019).

Curiously, despite the equally important role that the victim plays in rape events, very few studies have examined the offense characteristics that influence the journey from his/her residence to the crime scene. In their study, Ceccato and colleagues (2017) investigated the situational conditions preceding rapes that took place close to, versus far away from, the victim’s home. In rapes where the journey-to-victimization was quite far, victims were most commonly engaged in social activities located in inner city areas characterized by a concentration of entertainment venues, bars, and restaurants. Following the routine activity perspective, in cases
where the victim was raped close to her home, she was most often engaged in activities
associated with everyday life (e.g., school, work, sport and leisure activities). More recently,
Chopin and Caneppele (2019b) investigated the individual and environmental factors associated
with the victim’s mobility in extrafamilial sexual assaults. These researchers found that child
victims (younger than 20 years old) were more likely to be sexually assaulted closer to home
when the offender is known to the victim, and when the rape took place in a business (i.e.,
commercial) land use area or close to a means of transport.

Lastly, no studies, to our knowledge, have investigated the offense characteristics
associated with a third distance measure: the journey from the offender’s residence to the
victim’s residence. This is certainly a limitation of this small literature as this measure, and the
offense characteristics that influence it, could add value to the investigation of stranger rapes as
well. Taken together, the current study addresses the aforementioned gaps in the literature by
exploring the following research questions:

1. Does the distance traveled among both offenders and victims from their home base to the
   crime site, as well as in relation to one another, vary when disaggregated by motive?
2. What offense characteristics predict the distances traveled by offenders and victims in
cases of stranger rape?

Methodology

Data

This study is based on a sample of 1009 cases of solved rapes that were committed in
France between 1979 and 2018. These data were obtained from a national police database that
includes information on the geographic and crime scene behavior of these events, as well as the
individuals involved in these crimes. Information about each rape was collected by police
detectives, coroners, and psychologists during the investigation, and was subsequently entered into the police database by crime analysts who are experts in extrafamilial sexual crimes.

The legal definition of rape has changed over the years. Because we used data distributed over a 40-year period, we decided to use an operational definition to identify rape cases. For the purpose of the current study, rape is operationalized as the occurrence of vaginal and/or anal penetration with a penis and/or foreign object(s) (i.e., inanimate objects used to perform vaginal and/or anal penetration).

All of the cases involved victims and offenders who had an extrafamilial and/or stranger relationship, implying that they did not have contact with one another prior to the time that the crime took place. Because past research has shown that assaults involving child victims are very different from those involving adults in terms of crime commission processes and distances traveled to the crime (see, e.g., Beauregard, Stone, Proulx, & Michaud, 2008; Chopin & Beauregard, 2019; Chopin & Caneppele, 2019a, 2019b), we decided to select only those cases that involved a victim aged 16 years or older. Furthermore, Chopin and Caneppele (2019b) found that mobility patterns vary between male and female victims. Consequently, we decided to include only cases involving female victims. In addition to the selection criteria outlined above, only cases were included that had available addresses for the offender’s residence, the victim’s residence, and the crime scene, and where the distance between any of these locations was less than 100 kilometers (see, also, Chopin & Caneppele, 2019a). This threshold was used to avoid the influence of outliers on the results.

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1 This cut-off age is used in most studies that focus on sexual crime to make the distinction between adult and child victims (see, e.g., Chopin & Beauregard, 2019; Leclerc, Wortley, & Smallbone, 2011).

2 Cases where the distance between the offender’s residence, the victim’s residence, and the crime scene exceeded 100 kilometers represented less than 5% of the population.
The victims in this sample, on average, were 31.16 years old \((SD=16.15)\), with the eldest victim being 94 years old. The majority of the victims were in a relationship \((67.60\%)\) at the time of the crime. In terms of activities at the time of the offense, 20.30\% of victims were involved in a social activity \(\text{e.g., at a bar with friends}\), 14.46\% of them consumed alcohol, and 4.85\% consumed drugs immediately prior to the attack. Offenders were aged 27.39 years \((SD=11.12)\), on average, with the eldest offender being 65 years old. The majority of offenders were in a relationship \((55.80\%)\) at the time of the offense and did not live alone \((87.10\%)\). A minority of the offenders \((16.00\%)\) engaged in paraphilic behavior \(\text{i.e., exhibitionism, voyeurism, transvestism, sadism, masochism, fetishism}\), and 19.50\% of them had a previous criminal history. In terms of activities that they engaged in at the time of the offense, some offenders consumed alcohol \((27.10\%)\) and drugs \((15.50\%)\) in the hours prior to the crime.

Measures

Three continuous dependent variables were of interest in the current study: (1) the distance between the offender’s residence and the crime scene \((O-C)\); (2) the distance between the victim’s residence and the crime scene \((V-C)\); and, (3) the distance between the offender’s residence and the victim’s residence \((O-V)\). All of these distances were Euclidian distances measured in meters\(^3\).

Temporal factors. Six dichotomous \((0=\text{no}, 1=\text{yes})\) variables that related to the timing of the offense were selected: (1) crime took place during the daylight hours \(\text{i.e., 6am-6pm}\); (2) crime took place during the weekend \(\text{i.e., Friday night until Sunday at midnight}\); (3) crime took place during the spring season; (4) crime took place during the summer season; (5) crime took place during the fall season; and, (6) crime took place during the winter season.

\(^3\) Similar to the research conducted by Block et al. (2007), meters were used instead of \((\text{half})\) miles or kilometers because the travel distance was quite short for most incidents.
Environmental characteristics. Seven dichotomous variables that describe the crime scene where the rape occurred were included: (7) crime took place in a residential setting (e.g., victim’s residence, offender’s residence, single-family dwelling, multi-family dwelling, third-party residence); (8) crime took place in a commercial setting (e.g., victim’s and/or offender’s place of work); (9) crime took place in an indoor public place (e.g., school, library, hospital, public washroom, theatre, religious facility, public swimming pool); (10) crime took place in a parking lot; (11) crime took place outdoors (i.e., residence front/back yard, play space, green space, jogging/bike path, public park, wooded area, alley); (12) crime took place in a deserted place (i.e., nobody could see nor interrupt the offense); and, (13) the encounter, crime, and victim release (ECR) took place in the same location.

Offender motivation type. To classify the 1009 offenders according to their motivation for committing the crime, two-step cluster analysis was performed. Variables were selected to classify offenders according to existing rapist motive subtypes as described above (see Robertiello & Terry, 2007, for a more comprehensive review). Importantly, these variables were also chosen because they would be observable to law enforcement officials during an active investigation (i.e., would not require any information from the offender in order to determine motive). This analysis yielded a four-cluster solution (see Table A.1 in the Appendix).

Cluster 1 – compensatory rapist (n=412; 40.83%) – described an offender who was generally unfamiliar with the crime location, did not target the victim, and generally used a con (non-coercive) approach strategy. This offender never tortured the victim and he was unlikely to perform anal penetration, perpetrate acts of psychological terror, nor inflict severe/extreme physical injuries on the victim. Cluster 2 – angry/power rapist (n=324; 32.12%) – suggested an offender who was generally unfamiliar with the crime location, but who targeted the victim prior
to the attack and who used a blitz (coercive) approach strategy. This offender did not torture the victim and he was the least likely to perform anal penetration. Overall, very few of these rapists engaged in either psychological terror or the infliction of severe/extreme physical injuries on their victim. Cluster 3 – *opportunistic* rapist (*n*=202; 20.01%) – corresponds to an offender who was familiar with the crime scene prior to the attack, but who did not target their victims ahead of time. The majority of these offenders used a non-coercive (con) approach with their victim. None of these offenders engaged in torture, and only a few used psychological terror and/or inflicted severe or extreme injuries on their victim. Cluster 4 – *sadistic* rapist (*n*=71; 7.04%) – suggested an offender who was generally unfamiliar with the crime scene prior to the time of the offense. Interestingly, these offenders did not specifically target their victims and they opted for the non-coercive (con) approach in the majority of cases. Sadists always engaged in torture and they were more likely to perpetrate anal penetration, psychological terror, and inflict severe/extreme physical injury on their victims. Motive sub-types of (14) *compensatory*; (15) *angry/power*; (16) *opportunistic*; and, (17) *sadistic* were used as dichotomous independent variables in subsequent analyses.

Victim activity at time of offense. Four dichotomous variables describe the type of activity that the victim was engaged in at the time of the offense: (18) *domestic activities/sleeping*; (19) *traveling/driving*; (20) *socializing with friends*; and, (21) *prostitution*.

Analytic Strategy

To answer our research questions, the data were analyzed in two stages. First, to determine whether the average distances traveled varied by offender motive, we used the Kruskal-Wallis test. This non-parametric test is used to determine whether there are statistically significant differences between two or more independent groups (i.e., motive type) based on a
continuous variable (i.e., distance traveled). Second, to test the relationship between distance traveled and pre-offense characteristics, we used both bivariate and multivariate analyses. Bivariate analyses (i.e., Mann-Whitney test⁴) were first performed to examine the differences between the dependent (average distances) and independent variables. Using only the significant variables at the bivariate level (p ≤ 0.05), a sequential negative binomial logistic regression⁵ was then performed for each dependent variable. This was done not only to better understand the impact of each independent variable while taking into account the other significant variables in the model, but also to identify which of the four groups of variables (i.e., temporal factors, environmental characteristics of the crime scene, offender motivation type, and victim activity at the time of the offense) explained more of the variance in distance travelled.

**Results**

**Offender motivation and travel distances**

Table 1 presents the results of the Kruskal-Wallis analyses that tested for significant differences in distances traveled between the four motivational groups. Findings indicated that there are significant differences across all four groups in terms of the average distances travelled for each of the following parameters: distance between offender’s residence and crime scene; distance between victim’s residence and crime scene; and, the distance between the offender’s residence and victim’s residence. In terms of the first parameter, angry rapists (H(3) = 28.66, p = .000) travelled the farthest distance from their residence to the crime scene in comparison to rapists who have other motivations. In terms of journey to victimization, victims of opportunistic

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⁴ This non-parametric test was chosen because the dependent variables did not follow a normal distribution.
⁵ Sequential negative binomial logistic regression was chosen instead of multiple regression because the dependent variables did not follow a normal distribution.


(H(3) = 38.75, p = .000) rapists tend to travel the greatest distance in comparison to rapists who have other motivations. Finally, when analyzing the distance between the offender and victim’s residence, angry rapists and their victims tend to live the farthest apart (H(3) = 7.65, p = .047).

[INSERT TABLE 1 HERE]

Travel distances and offense characteristics

_Bivariate analyses._ Table 2 presents the results of the bivariate analyses between three dependent variables (i.e. O-C, V-C, O-V) and four groups of independent variables. In terms of the first dependent variable, distance between offenders’ residences and the crime scene, our findings indicated that when the crime occurred during daylight hours, offenders traveled farther (Z = -2.27, p = .015). When the rape took place in a residential area, offenders travelled less (Z = -5.32, p = .000). Conversely, when rapes occurred outdoors (Z = -3.66, p = .002) and in deserted places (Z = -1.91, p = .039), offenders traveled farther. In terms of motivation, we found that opportunistic (Z = -5.01, p = .000) and compensatory (Z = -3.99, p = .000) rapists traveled significantly less distance from their residence to the crime scene in comparison to the other rapists. Finally, when victims were traveling/driving at the time of their attack (Z = -5.57, p = .000) or engaging in prostitution (Z = -3.73, p = .000), rapists tended to travel farther.

Findings regarding the second dependent variable, which measures journey to victimization, suggest that when victims were assaulted in a residential area (Z = -12.00, p <= .000), and when the encounter, crime, and victim release occurred in the same location (Z = -11.02, p = .000), victims traveled significantly less distance. Conversely, when rapes occurred outdoors (Z = -7.97, p = .000), victims tended to travel farther distances from their home to the crime location. In terms of offender motivation, victims of opportunistic rapists (Z = -5.54, p = .000) traveled farther from their home to the crime scene, while victims of angry/power rapists
(Z = -5.27, \( p < 0.01 \)) traveled significantly far less. In terms of victim activities, those who were assaulted during domestic activities/sleeping tended to travel less (Z = -12.87, \( p = .000 \)), while those who were assaulted during traveling/driving (Z = -4.24, \( p = .000 \)), socializing with friends (Z = -3.93, \( p = .000 \)), and engaging in prostitution (Z = -2.81, \( p = .012 \)), traveled farther.

In regards to the final dependent variable, we found that when rapes occurred in residential areas (Z = -4.93, \( p = .000 \)), in the same location as the encounter and victim release (Z = -5.25, \( p = .000 \)), or in a deserted place (Z = -1.95, \( p = .046 \)), the average distance between the victims’ and offenders’ residences is less than if these characteristics were not present. Similarly, when the victim was involved in domestic activities or was sleeping at the time of the attack (Z = -4.97, \( p = .000 \)), there was less distance between her residence and that of the offender. Conversely, when rape occurred in a commercial area (Z = -2.10, \( p = .043 \)) or outdoors (Z = -3.39, \( p = .001 \)), there was a greater distance between the victim and offender’s residence. In terms of motivation, when the offender was a compensatory rapist (Z = -2.76, \( p = .007 \)), there was a greater distance between his residence and that of the victim. Lastly, when the victim was traveling/driving (Z = -4.98, \( p = .000 \)), socializing with friends (Z = -1.96, \( p = .05 \)), or was engaging in prostitution (Z = -3.11, \( p = .002 \)), the distance between the offender’s and victim’s residence was greater in comparison to those cases where these characteristics were not present.

[INSERT TABLE 2 HERE]

**Multivariate analyses.** Table 3 presents the findings of the negative binomial sequential regression analyses with respect to the distance between the offender’s residence and the crime scene. Model 1 includes only the temporal characteristics. Results show that in rapes perpetrated during daylight hours (\( \beta = .287, p = .000 \)), the distance between the offender’s residence and the crime scene was likely to be greater as compared to rapes that occurred during the night. Model 2
introduces environmental characteristics. The variable that was significant in Model 1 remained significant in Model 2. In cases where rape occurred in residential areas ($\beta = -0.251, p = .008$) or in deserted locations ($\beta = -0.133, p = .047$), the distance between the offender’s residence and the crime scene was likely to be less as compared to cases involving other environmental characteristics. Model 3 introduces offender motivation classifications. Compared to Model 2, all of the variables remained significant with the exception of the deserted location. In cases involving opportunistic rapists ($\beta = -0.638, p = .000$), the distance between the offender’s residence and the crime scene was likely to be less as compared to cases involving other offender motivations. Model 4 introduces victims’ activities at the time of attack. All of the variables that were significant in Model 3 remained significant in Model 4. In cases where victims were engaging in prostitution ($\beta = .641, p = .000$), the distance between the offender’s residence and the crime scene was likely to be greater as compared to cases involving other victim activities.

Table 4 presents the findings of the negative binomial sequential regression analyses with respect to the distance between the victim’s residence and the crime scene. Model 1 includes only the environmental characteristics. Results show that in rapes perpetrated in a residential area ($\beta = -0.865, p = .000$), outdoors ($\beta = -0.174, p = .000$) or in the same location as the encounter and victim release ($\beta = -0.895, p = .000$), the distance between the victim’s residence and the crime scene was likely to be less as compared to cases with other environmental characteristics. Conversely, in rape cases perpetrated in a commercial area ($\beta = .603, p = .000$), the distance between the victim’s residence and the crime scene was likely to be greater as compared to cases with other environmental characteristics. Model 2 introduces offender motivation classifications. As compared to Model 1, all of the variables in Model 2 remained significant with the exception
of whether the rape took place outdoors. In cases involving opportunisti rapists (β = .147, p = .034), the distance between the victim’s residence and the crime scene was likely to be greater as compared to cases involving other characteristics. Conversely, in cases involving angry/power rapists (β = -0.533, p = .000) the distance between the victim’s residence and the crime scene was likely to be less as compared to cases involving other characteristics. Model 3 introduces the victim’s activity at the time of attack. All of the variables that were significant in Model 2 remained significant in Model 3. In cases where victims were involved in domestic activities/sleeping (β = -0.931, p = .000), the distance between the victim’s residence and the crime scene was likely to be less, but when victims were traveling/driving (β = .366, p = .000), the distance between their residence and the crime scene was likely to be greater as compared to cases involving other characteristics.

[INSERT TABLE 4 HERE]

Table 5 presents the findings of the negative binomial sequential regression analyses with respect to the distance between the victim’s and offender’s residence. Model 1 includes only the environmental characteristics. Results indicate that shorter distances were traveled between the victim’s and offender’s residences in rapes perpetrated in residential (β = -0.255, p = .009) and commercial areas (β = -0.336, p = .023) in comparison to those perpetrated in other land use areas. Similarly, in cases where the crime scene was in the same location as the encounter and release location (β = -0.280, p = .000), and where the rape took place in a deserted place (β = -0.264, p = .000) were likely to have shorter distances between the victim’s and offender’s residence as compared to those cases involving other environmental characteristics. Conversely, the distance between the victim’s and offender’s residence was likely to be greater if the rape took place outdoors (β = .022, p < .024). Model 2 introduces the classifications of offender
motivation. As compared to Model 1, all of the variables remained significant except for one; rapes that took place outdoors. In cases involving compensatory rapists ($\beta = .167, p < .031$), the distance between the victim’s and offender’s residences was likely to be greater as compared to cases involving other motive classifications. Model 3 introduces the victim’s activity at the time of attack. All of the variables that were significant in Model 2 remained significant in Model 3. In cases where victims were traveling/driving ($\beta = .464, p = .000$) at the time of the attack, or engaging in prostitution ($\beta = .302, p = .045$), the distance between their residence and that of their offender was likely to be greater as compared to cases involving other activities.

[INSERT TABLE 5 HERE]

**Discussion**

Three key findings emerged from this study. First, in line with previous work (e.g., Barbaree et al., 1994; Berger, 2000; Groth, 1979; Knight & Prentky, 1990), there was clear evidence of the compensatory, sadistic, angry/power, and opportunistic motive subtypes in this sample of French rapists. Interestingly, given the large size of the sample used here, the fact that additional motives did not emerge suggests that these classifications are relatively robust and parsimonious. Second, the journey-to-crime, the journey-to-victimization, and the distance traveled between the residences of both the offender and the victim differed by motive to offend. This finding suggests that crime site selection is not a random choice; rather, at least for some offenders, it is a patterned and calculated decision. Third, several pre-crime factors predict distances traveled by offenders and victims to the crime site, as well as the distance between the offender and victim’s residence. However, the influence of these variables differs depending on the dependent variable of interest.

**Rape distances by motive type**
While most studies have demonstrated that offenders commit their crimes close to their residence, less is known about how the victim’s journey fairs in comparison. Generally, our findings showed that rapists travelled longer distances to the crime scene in comparison to the victim in all cases. In support of the buffer zone and distance decay concepts (see Brantingham & Brantingham, 1981), none of the rapists offended in the area that directly surrounded their place of residence. In terms of actual distances traveled by rapists, there was significant variability across offender motive. Angry/power rapists commuted the farthest, while opportunistic offenders traveled the least amount of distance. One possible explanation for this finding is that angry/power rapists, in comparison to the other subtypes, were more likely to target specific victims for their crimes. Thus, the search for specific victim attributes may have necessitated farther travels in comparison to those offenders who were less discriminatory as to who their victim could be (i.e., opportunistic offenders).

Findings also suggested that victims are attacked relatively near to where they live. This finding was also noted by Ceccato (2014) who found that more than half of the rapes in her sample occurred within one kilometer of the women’s residence. Underscoring these findings is the notion that the places in which individuals spend the majority of their time and in which they are the most comfortable are also the places in which women, in particular, are at the highest risk of sexual violence. These findings also confirm Chopin and Caneppele’s (2019b) suggestion that from a rational choice perspective, offenders may perceive the victim’s home and surrounding area as a “safer” environment to commit and complete the crime. This appears to be the case for compensatory rapists whose victims are attacked much closer to their residence (average of 3.26 kilometers) than those of other rapist subtypes. One possible explanation for this could be that compensatory rapists are less brazen due to their general lack of confidence, and thus use a ruse
to lure their victim back to her own private space where it is easier for them to initiate and complete the offense without interruption. Victims of *opportunistic* rapists are assaulted the farthest away from their residence (average of 6.79 kilometers), suggesting that these attacks occur when they are engaged in routine activities away from the home. Regardless of distance measure (from either the offender or victim’s residence to the crime scene), the finding that most rapes occurred relatively close to home is well supported by crime pattern theory which suggests crime opportunities are more abundant in areas where individuals spend the majority of their time.

More variability was found in regards to the average distance traveled between the offender and victim’s residence across offending motives. *Opportunistic* rapists were observed to have lived the closest to their victims (average of 4.92 kilometers), indicating that they share the ‘same spatial awareness’ (Brantingham & Brantingham, 1984), whereas *angry/power* rapists lived the farthest away (average of 10.38 kilometers). Taken as a whole, the significant differences in spatial behavior across motive type outlined above suggest that this is an important element for investigators to consider to seek out possible clues as to how far the victim and offender traveled to the crime scene, and where they reside relative to each other. Failure to disaggregate these journeys based on motive masks the considerable variation that exists in the journeys-to-crime and victimization that could prove useful to the investigation.

**Offense characteristics associated with distance measures**

The final aim of this study was to investigate which offense characteristics were predictive of the actual distance traveled between three locations: offender’s residence, victim’s residence, and the crime scene. We found that rapist motivation, in addition to environmental characteristics and victim activity at the time of attack, predict distances traveled by offenders
and victims to the crime scene, as well as the distance between the offender and victim’s residence. Despite temporal variables being theoretically significant, they did not play an important role in the offender nor the victim’s spatial movements. Rather, the physical characteristics of the environment (e.g., residential versus commercial) seem to dictate the type of social activities that will take place there (e.g., sleeping/domestic activities versus prostitution), and thus the profile of victim who will occupy these spaces. While only speculative due to data limitations, this seems to be an important factor when trying to better understand the variability in distance travelled among offenders and victims.

In terms of the average distance traveled by the offender, motivation was the strongest predictor, followed by the victim’s activity at the time of the attack. More specifically, opportunistic rapists are less likely to travel far from their residence to offend, especially if the offending opportunity arises in a residential land use area during nighttime hours (see also Warren, Reboussin, & Hazelwood, 1995). This finding suggests that rapes that share these characteristics are likely to be committed by offenders who take advantage of crime opportunities within their own neighborhoods. Stevens (1994) similarly found that the majority of sex offenders in his sample described “easy prey” or random opportunity to be the most common criteria for selecting a victim and subsequently initiating an offense. Together, these suggest that the distance travelled by non-opportunistic offenders to the crime scene is largely a result of other factors. In our study, one such factor was if the victim was engaged in prostitution at the time of the attack. In these cases, offenders were observed to have traveled farther from their residence as red-light districts are concentrated to only very few zones within any given city (Ashworth, White, & Winchester, 1988).
Environmental characteristics, followed by the victim’s activity at the time of the attack, were the best explanatory factors for the two remaining distance measures. Two contexts emerged as contributing to the relative distance between where the victim lived and the crime site. Assaults perpetrated by angry/power rapists that were characterized by no mobility (i.e., ECR), occurred in a residential land use area, and when the victim was engaged in domestic activities/sleeping, were more likely to occur closer to the victim’s home. Conversely, attacks that occurred in a commercial land use area and while the victim was traveling/driving were likely to have occurred farther away from the victim’s residence. This finding is well supported by prior literature that has found that female rape typically occurs “when the victim is on the move, on the way from or to places, often from a bus stop to the victim’s residence or from a restaurant to a nightclub, or on the way to/from a subway station” (Ceccato, 2014, p. 103), or while inside a vehicle/taxi (Ceccato et al., 2017). These findings reinforce the notion that certain places and activities that are typically perceived as being safe, may actually put females at a higher risk of rape victimization both nearby and far from their home.

Also of investigative importance is the variables that shed light on how far the victim and offender live relative to each other. Shorter distances were observed when the crime occurred in a residential or commercial land use area, a deserted place, and when there was no mobility during the crime (i.e., ECR). Conversely, these individuals live farther apart when the crime is perpetrated by a compensatory rapist, and when the victim is engaged in either traveling/driving or prostitution at the time of the attack. These results contribute to the knowledge base of journey to crime distances and offender crime scene behaviors that Santtila, Laukkanen, and Zappalá (2007) argue is still largely needed.
Lastly, of equal significance to this discussion is those variables that were not predictive of any of the three distance measures. With the exception of the first measure (O-C), the time of the day, day of the week, and the season of the year did not influence the journey-to-victimization nor the distance between the victim’s and offender’s residence. This was surprising given the theoretical and empirical literature that acknowledges the importance of temporal variations in the occurrence of rape (e.g., Amir, 1971; Ceccato, 2014; Gabor & Gottheil, 1984). While the current data cannot provide an explanation for this finding, the idea that stranger rapes are frequently premeditated to some degree before their occurrence (Beauregard & Leclerc, 2007; Rossmo, 2000) as compared to other crimes that are more impulsive, and thus more likely to be influenced by temporal fluctuations (e.g., domestic violence; see Cohn, 1993), might explain why other factors emerged as being more influential to the spatial movements of offenders and victims.

**Conclusion**

The findings of this study have implications primarily for police officers who are tasked with the investigation of stranger rapes. As mentioned above, these cases pose considerable challenges for law enforcement officers due to the lack of available information in most cases about the suspect. Thus, we have shown that by having investigators focus on particular modus operandi variables (e.g., indications that the offender was already familiar with the crime scene or that he specifically targeted his victim, the type of approach that the offender used with the victim, as well as whether the victim was physically tortured, psychologically terrorized, anally penetrated, and suffered severe and extreme physically injury), it is possible for them to infer a stranger offender’s motive for committing the assault. This piece of information, on its own, may provide investigators with potentially valuable information about the personal characteristics of
the offender, his offending process, and the risk that he will escalate in violence with subsequent victims (e.g., indications of a sadist would likely mean that he will continue to recidivate sexually and that these assaults will be extremely violent in nature) as thoroughly discussed in prior literature.

A second implication of this work is that investigators may be able to use these findings to help predict the relative location of the unknown offender’s home-base relative to the crime scene and/or the victim’s residence, since these latter two locations would likely be known at the time of the police report. For example, inferring the offender’s motive for a particular sexual assault will provide the police with an approximate distance of how far the offender lives from the crime scene and the victim’s residence, which could be helpful in the prioritization of suspects. Furthermore, using these distance averages as a baseline, investigators may be able to improve their predictive accuracy by recognizing where the offense occurred and the victim’s activity at the time of attack, to better tailor the approximate distance the offender may have travelled relative to the place of the crime and/or the victim’s residence. This information undoubtedly has utility for better targeting police resources in such difficult-to-solve cases.

Some limitations are present in the current study. Similar to those noted by Chopin and Beauregard (2019), due to the nature of the data, the cases analyzed in this study represent only those rapes that have been brought to the attention of the police. Thus, these findings may or may not be generalizable to all rape cases involving adult female victims. Second, while we hope that these findings will be useful for future investigations involving stranger rape, it is possible that some of the information that we used to classify offender motivations will be unavailable or unobservable by the police after a crime has occurred. Thus, it may become difficult to determine motive based on crime scene behavior in the absence of the offender. Similarly, it
could be argued that inferring offender motivation based on crime scene characteristics may prove difficult or in fact be misleading in the absence of speaking with the offender directly; however, offenders may not always have a rationale for their offending behavior, or may even be deceptive about their motive when being interviewed. Thus, we argue that classifying motive according to observable behavioral data, such as what we have done in the current study, can actually overcome both of these limitations (see also Amir, 1971; Palmer, 1988). There may also be other pre-crime factors that we did not take into account that would better explain the variation in distance traveled by both offenders and victims (e.g., the offender’s activity in the moments immediately prior to the crime); future research should take this into account. Finally, as is the major limitation with most research on the spatial mobility of crime, it is assumed that the journeys-to-crime and victimization both begin at the place of residence, when in fact, this may not be the case. Thus, it could be that offenders and victims start their journeys from another activity node, such as their place of work or a family member’s residence, and therefore these distances would not be reflected in the analyses conducted here.

Future research should investigate possible interaction effects between the temporal, environmental, offender motive, and victim activity variables, to see if those provide a more comprehensive understanding of journey-to-crime and victimization. It would also be interesting to replicate this study with other sub-groups of sexual offenders (e.g., child molesters or sexual homicide offenders), or different victim types (e.g., male victims, elderly victims), to see how the findings would compare. Finally, because localities have different built environments that ultimately influence how far people travel to engage in both their routine and criminal activities, replication of these analyses using local crime data will be the most pragmatic for police
investigating stranger rapes within that jurisdiction.

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References

Amir, M. (1971). *Patterns in forcible rape*. Chicago, IL: The University of Chicago Press.

Ashworth, G. J., White, P. E., & Winchester, H. P. M. (1988). The red-light district in the west European city: A neglected aspect of the urban landscape. *Geoforum, 19*(2), 201-212. doi: 10.1016/S0016-7185(88)80029-0

Barbaree, H. E., Seto, M. C., Serin, R. C., Amos, N. L., & Preston, D. L. (1994). Comparison between sexual and nonsexual rapist subtypes. *Criminal Justice and Behavior, 21*(1), 95-114. doi: 10.1177/0093854894021001007

Beauregard, E., & Leclerc, B. (2007). An application of the rational choice approach to the offending process of sex offenders: A closer look at the decision-making. *Sexual Abuse, 19*(2), 115-133. doi: 10.1007/s11194-007-9043-6

Beauregard, E., & Martineau, M. M. (2017). Introduction. In E. Beauregard & M. M. Martineau (Eds.), *The sexual murderer: Offender behavior and implications for practice*. Oxon: UK: Routledge.

Beauregard, E., Proulx, J., & Rossmo, D. K. (2005). Spatial patterns of sex offenders: Theoretical, empirical, and practical issues. *Aggression and Violent Behavior, 10*(5), 579-603. doi:10.1016/j.avb.2004.12.003

Beauregard, E., Stone, M. R., Proulx, J., & Michaud, P. (2008). Sexual murderers of children: Developmental, precrime, crime, and postcrime factors. *International Journal of Offender Therapy and Comparative Criminology, 52*(3), 253-269. doi:10.1177/0306624X07303907

Berger, R. D. (2000). *Successfully investigating acquaintance sex assault: A national training manual for law enforcement*. Arlington, VA: National Center for Women and Policing,
Office of Justice Programs.

Block, R., Galary, A., & Brice, D. (2007). The journey to crime: Victims and offenders converge in violent index offences in Chicago. Security Journal, 20(2), 123-137. doi: 10.1057/palgrave.sj.8350030

Brantingham, P. J., & Brantingham, P. L. (1984). Patterns in crime. New York, NY: Macmillan.

Brantingham, P. J., & Brantingham, P. L. (2003). Anticipating the displacement of crime using the principles of environmental criminology. In M. J. Smith & D. B. Cornish (Eds.), Theory for practice in situational crime prevention (pp. 119-148). Monsey, NY: Criminal Justice Press.

Brantingham, P. L., & Brantingham, P. J. (1981). Notes on the geometry of crime. In P. J. Brantingham & P. L. Brantingham (Eds.), Environmental criminology (pp. 27-54). Beverly Hills, CA: Sage.

Brantingham, P. L., & Brantingham, P. J. (1993). Nodes, paths and edges: Considerations on the complexity of crime and the physical environment. Journal of Environmental Psychology, 13(1), 3-28. doi: 10.1016/S0272-4944(05)80212-9

Budrionis, R., & Jongsma, A. E. (2003). The sexual abuse victim and sexual offender treatment planner. West Sussex: John Wiley & Sons.

Ceccato, V. (2014). The nature of rape places. Journal of Environmental Psychology, 40, 97-107. doi: 10.1016/j.jenvp.2014.05.006

Ceccato, V., Li, G., & Haining, R. (2019). The ecology of outdoor rape: The case of Stockholm, Sweden. European Journal of Criminology, 16(2), 210-236. doi: 10.1177/1477370818770842

Ceccato, V., Wiebe, D. J., Eshraghi, B., & Vrotsou, K. (2017). Women’s mobility and the
situational conditions of rape: Cases reported to hospitals. *Journal of Interpersonal Violence*. Advance online publication. doi: 10.1177/0886260517699950

Chopin, J., & Beauregard, E. (2019). Sexual abuse of elderly victims investigated by the police: From motives to crime characteristics. *Journal of Interpersonal Violence*. Advance online publication. doi: 10.1177/0886260518821456

Chopin, J., & Caneppele, S. (2019a). Geocoding child sexual abuse: An explorative analysis on journey to crime and victimization from French police data. *Child Abuse & Neglect, 91*, 116-130. doi:10.1016/j.chiabu.2019.03.001

Chopin, J., & Caneppele, S. (2019b). The mobility crime triangle for sexual offenders and the role of individual and environmental factors. *Sexual Abuse, 31*(7), 812-836. doi:10.1177/1079063218784558

Cohen, L., & Felson, M. (1979). Social change and crime rate trends: A routine activity approach. *American Sociological Review, 44*, 588-608. doi: 10.2307/2094589

Cohen, M., Seghorn, T., & Calmas, W. (1969). Sociometric study of the sex offender. *Journal of Abnormal Psychology, 74*(2), 249-255. doi: 10.1037/h0027185

Cohn, E. (1993). The prediction of police calls for service: The influence of weather and temporal variables on rape and domestic violence. *Journal of Environmental Criminology, 13*(1), 71-83. doi: 10.1016/S0272-4944(05)80216-6

Cornish, D. B., & Clarke, R. V. (1986). *The reasoning criminal: Rational choice perspectives on offending*. New York, NY: Springer-Verlag.

Davies, A., & Dale, A. (1995). *Locating the stranger rapist*. Police Research Group Special Interest Series: Paper 3, Home Office Police Department, London.

Douglas, J., Burgess, A. W., Burgess, A. G., & Ressler, R. K. (2006). *Crime classification*
manual: A standard system for investigating and classifying violent crimes (2nd ed.).
Hoboken, NJ: Wiley.

Duwe, G., Donnay, W., & Tewksbury, R. (2008). Does residential proximity matter? A geographic analysis of sex offense recidivism. Criminal Justice and Behavior, 35(4), 484-504. doi: 10.1177/0093854807313690

Gabor, T., & Gottheil, E. (1984). Offender characteristics and spatial mobility: An empirical study and some policy implications. Canadian Journal of Criminology, 26(3), 267-281.

Groth, A. N. (1979). Men who rape: The psychology of the offender. New York: Plenum Press.

Hazelwood, R. R., & Burgess, A. W. (1987). Practical aspects of rape investigation: A multidisciplinary approach. New York: Elsevier.

Houston, J. C. (2002). Sexual aggression: Research, theories, and practice. In J. Petrak & B. Hedge (Eds.), The trauma of sexual assault: Treatment, prevention and practice (pp. 305-330). West Sussex, UK: Wiley.

Knight, R. A., & Prentky, R. A. (1990). Classifying sex offenders: The development and corroboration of taxonomic models. In W. L. Marshall & H. E. Barbaree (Eds.), Handbook of sexual assault: Issues, theories, and treatment of the offenders (pp. 23-52). New York: Plenum Press.

LeBeau, J. L. (1987a). Patterns of stranger and serial rape offending: Factors distinguishing apprehended and at large offenders. Journal of Criminal Law and Criminology, 78(2), 309-326.

LeBeau, J. L. (1987b). The journey to rape: Geographic distance and the rapist’s method of approaching the victim. Journal of Police Science and Administration, 15(2), 129-136.
Leclerc, B., Wortley, R., & Smallbone, S. (2011). Getting into the script of adult child sex offenders and mapping out situational prevention measures. *Journal of Research in Crime and Delinquency, 48*(2), 209-237.

Palermo, G. B. (2003). *Faces of violence* (2nd ed.). Springfield: IL: Charles C Thomas.

Palmer, C. T. (1988). Twelve reasons why rape is not sexually motivated: A skeptical examination. *The Journal of Sex Research, 25*(4), 512-530. Retrieved from www.jstor.org/stable/3812897

Pardue, A., & Arrigo, B. A. (2008). Power, anger, and sadistic rapists: Toward a differentiated model of offender personality. *International Journal of Offender Therapy and Comparative Criminology, 52*(4), 378-400. doi: 10.1177/0306624X07303915

Quinsey, V. L., & Upfold, D. (1985). Rape completion and victim injury as a function of female resistance strategy. *Canadian Journal of Criminology, 17*(1), 40-50. doi: 10.1037/h0080128

Rengert, G. (2004). The journey to crime. In G. J. N. Bruinsma, H. Elffers, & J. DeKeijser (Eds.), *Punishment, places and perpetrators: Developments in criminology and criminal justice research* (pp. 169-181). Cullompton, UK: Willan Publishing.

Robertiello, G., & Terry, K. (2007). Can we profile sex offenders? A review of sex offender typologies. *Aggression and Violent Behavior, 12*(5), 508-518. doi: 10.1016/j.avb.2007.02.010

Rossmo, D. K. (2000). *Geographic profiling*. Boca Raton, FL: CRC Press.

Rossmo, D. K., Davies, A., & Patrick, M. (2004). Exploring the geo-demographic and distance relationships between stranger rapists and their offences (Special Interest Series: Paper 16). London, UK: Research, Development and Statistics Directorate.
Santtila, P., Laukkanen, M., & Zappala, A. (2007). Crime behaviours and distance travelled in homicides and rapes. *Journal of Investigative Psychology and Offender Profiling, 4*(1), 1-15. doi: 10.1002/jip.56

Santtila, P., Laukkanen, M., Zappala, A., & Bosco, D. (2008). Distance travelled and offence characteristics in homicide, rape, and robbery against business. *Legal and Criminological Psychology, 13*(2), 345-356.

Stevens, D. J. (1994). Predatory rapists and victim selection techniques. *The Social Science Journal, 31*, 421-433. doi: 10.1016/0362-3319(94)90033-7

Warren, J., Reboussin, R., & Hazelwood, R. (1995). The geographic and temporal sequencing of serial rape. Final report submitted to U.S. Department of Justice. Washington, DC: National Institute of Justice, Office of Justice Programmes.

Warren, J., Reboussin, R., Hazelwood, R. R., Cummings, A., Gibbs, N., & Trumbetta, S. (1998). Crime scene and distance correlates of serial rape. *Journal of Quantitative Criminology, 14*(1), 35-59.

White, R. C. (1932). The relation of felonies to environmental factors in Indianapolis. *Social Forces, 10*(4), 498-509. doi: 10.2307/2569897
**Tables**

Table 1. Kruskal-Wallis test of average distances travelled by offender motivation.

| Average distances (km) | Compensatory | Angry/Power | Opportunistic | Sadistic |
|------------------------|--------------|------------|--------------|----------|
| Distance between offender’s residence and crime scene \(^1,^2\) | 11.09* | 12.97* | 9.66* | 12.04* |
| Distance between victim’s residence and crime scene \(^1,^2\) | 3.26*** | 6.42*** | 6.79*** | 5.76*** |
| Distance between offender’s and victim’s residence \(^1,^2\) | 9.50*** | 10.38*** | 4.92*** | 9.12*** |

*Notes. *\(p \leq .05\); **\(p \leq .001\).*

\(^1\)Mean.

\(^2\)Kruskal-Wallis test has been performed.
## Table 2. Bivariate analyses between independent and dependent variables (N = 1009).

|                      | Mann-Whitney test Z-Score |                      | Mann-Whitney test Z-Score |                      | Mann-Whitney test Z-Score |
|----------------------|---------------------------|----------------------|---------------------------|----------------------|---------------------------|
|                      | O-C                      | V-C                  | O-V                      |                      |                          |
|                      | No  | Yes  | No  | Yes  | No  | Yes  | No  | Yes  |                          |
| **Temporal Factors** |     |      |     |      |     |      |     |      |                          |
| Daylight             | 8032.96 | 10699.74 | -2.27* | 5192.42 | 5902.42 | -0.29 | 10794 | 13341.92 | -1.761                  |
| Weekend              | 9443.12 | 8030.75 | -1.55 | 5262 | 5713.7 | -0.99 | 11953.47 | 11171.06 | -1.498                  |
| Spring               | 8942.01 | 8857.55 | -0.17 | 5426.15 | 5437.53 | -0.78 | 11791.23 | 11195.65 | -0.8                    |
| Summer               | 9120 | 8397.42 | -0.96 | 5514.11 | 5205.13 | -0.08 | 11734.38 | 11402.99 | -0.146                  |
| Fall                 | 8782.58 | 14857.993 | -1.02 | 5411.41 | 5482.59 | -0.11 | 11264.02 | 12800.04 | -1.872                  |
| Winter               | 8848.67 | 9164.63 | -0.21 | 5368.91 | 5631.29 | -0.83 | 11783.22 | 11171.06 | -1.253                  |
| **Environmental Characteristics** | | | | | | | |
| Residential          | 10121.17 | 7737.37 | -5.32*** | 7233.04 | 3649.78 | -12.00*** | 13250.08 | 10058.22 | -4.93***                  |
| Commercial           | 8838.36 | 9930.45 | -2.09* | 5199.23 | 8209.78 | -1.21 | 11394.88 | 14647.23 | -2.103*                     |
| Indoor public place  | 8938.36 | 8601.62 | -0.13 | 5479.33 | 4502.29 | -0.73 | 11812.49 | 8525.19 | -1.208                    |
| Parking lot          | 9138.63 | 5811.64 | -0.58 | 5408.49 | 5721.68 | -0.26 | 11856.79 | 8589.5 | -0.895                    |
| Outdoors             | 8220.15 | 9860.9 | -3.66** | 4692.69 | 6416.39 | -7.97*** | 10590.79 | 13054.27 | -3.398***                  |
| Deserted place       | 9911.16 | 8350.12 | -1.91* | 6558.53 | 4777.72 | -1.52 | 13060.21 | 10826.01 | -1.954*                     |
| ECR                  | 9394.39 | 8240.66 | -1.73 | 6942.32 | 3254.01 | -11.02*** | 12860.09 | 9893.99 | -5.257***                  |
| **Offender Motivation Type** | | | | | | | |
| Opportunistic        | 9920.21 | 4929.11 | -5.01*** | 5093.68 | 6768.51 | -5.54*** | 12137.21 | 9668.97 | -1.633                    |
| Sadistic             | 8905.58 | 9124.73 | -0.90 | 5403.92 | 5760.03 | -0.29 | 11612.8 | 12043.08 | -0.186                    |
| Compensatory         | 7913.31 | 10381.18 | -3.99*** | 4745.5 | 6919.36 | -0.48 | 10724.63 | 12973.92 | -2.764**                   |
| Angry/Power          | 8643.19 | 9508.36 | -0.60 | 6453.98 | 3261.91 | -5.27*** | 11902.84 | 11093.88 | -1.408                    |
| **Victim Activity at Time of Offense** | | | | | | | |
| Domestic activities/sleeping | 9082.91 | 8133.12 | -1.67 | 6270.62 | 1333.32 | -12.87*** | 11039.92 | 17313.99 | -4.173***                  |
| Traveling/driving    | 8159.58 | 16079.98 | -5.57*** | 5233.13 | 7270.34 | -4.24*** | 11039.92 | 17313.99 | -4.980***                  |
| Socializing with friends | 8965.53 | 7604.24 | -1.29 | 5357.24 | 7550.61 | -3.93*** | 11577.44 | 13584.24 | -1.963*                    |
| Prostitution         | 8795.45 | 10554.92 | -3.73*** | 5197.26 | 8444.51 | -2.81** | 11388.09 | 14961.37 | -3.112**                  |

**Notes.** *p ≤ .05; **p ≤ .01; ***p ≤ .001.

O-C = average distance in meters between offenders’ residences and crime scenes.
V-C = average distance in meters between victims’ residences and crime scenes.
O-V = average distance in meters between victims’ residences and offenders’ residences.
Table 3. Negative binomial sequential regression with the average distance between the offender’s residence and the crime scene as the dependent variable (N = 1009).

|         | Model 1       | Model 2       | Model 3       | Model 4       |
|---------|--------------|--------------|--------------|--------------|
|         | β             | S.E.         | β             | S.E.         | β             | S.E.         | β             | S.E.         |
| Daylight| .287***       | 0.066        | .265***       | 0.068        | .188**        | 0.069        | .174**        | 0.069        |
| Residential| -.251**      | 0.082        | -.258***      | 0.080        | -.262***      | 0.085        | -.262***      | 0.085        |
| Commercial| -.114        | 0.14         | 0.05          | 0.143        | -0.007        | 0.148        | -0.007        | 0.148        |
| Outdoor | 0.045         | 0.085        | 0.035         | 0.082        | -0.032        | 0.085        | -0.032        | 0.085        |
| Deserted place| -.133*       | 0.067        | -0.108        | 0.067        | -0.121        | 0.067        | -0.121        | 0.067        |
| Opportunistic| -.638***     | 0.089        | -.626***      | 0.090        | -.626***      | 0.090        | -.626***      | 0.090        |
| Compensatory| 0.044        | 0.071        | 0.056         | 0.071        | 0.056         | 0.071        | 0.056         | 0.071        |
| Traveling/driving| 0.018       |              | 0.093         |              | 0.093         |              | 0.093         |              |
| Prostitution|              | .641***      | 0.108         |              | 0.108         |              | 0.108         |              |
| Constant| 8.991***      | 0.038        | 9.184***      | 0.091        | 9.274***      | 0.102        | 9.228***      | 0.104        |
| Likelihood Ratio Chi²| 18.957***   |              | 42.213***     |              | 101.404***    |              | 142.612***    |              |
| Log Likehood| -10177.607   |              | -10165.979    |              | -10136.384    |              | -10115.78     |              |
| AIC     | 20359.215     |              | 20343.979     |              | 20288.768     |              | 20251.559     |              |
| AICc    | 20359.227     |              | 20344.043     |              | 20288.912     |              | 20251.78      |              |
| BIC     | 20369.048     |              | 20373.459     |              | 20328.102     |              | 20300.726     |              |

Note. *p ≤ .05; **p ≤ .01; ***p ≤ .001.
Table 4. Negative binomial sequential regression with the average distance between the victim’s residence and the crime scene as the dependent variable (N = 1009).

|                      | Model 1 |       | Model 2 |       | Model 3 |   |
|----------------------|---------|-------|---------|-------|---------|---|
|                      | β       | S.E.  | β       | S.E.  | β       | S.E.|
| Residential          | -.865***| 0.083 | -.785***| 0.084 | -.467***| 0.094|
| Commercial           | .603*** | 0.119 | .692*** | 0.120 | .672*** | 0.126|
| Outdoor              | -.174*  | 0.084 | -.129   | 0.084 | -.096   | 0.080|
| ECR                  | -.895***| 0.064 | -.838***| 0.064 | -.591***| 0.074|
| Opportunistic        | .147*   | 0.084 | -.014   | 0.087 | -       | -    |
| Angry/power          | -.533***| 0.073 | -.698***| 0.075 | -.931***| 0.111|
| Domestic activities/sleeping | - | - | - | - | - | -|
| Traveling/driving    | .366*** | 0.110 | -       | -     | -       | -    |
| Socializing with friends | 0.291  | 0.180 | -       | -     | -       | -    |
| Prostitution         | 0.175   | 0.129 | -       | -     | -       | -    |
| Constant             | 9.276***| 0.083 | 9.293***| 0.085 | 9.159***| 0.089|
| Likelihood Ratio Chi²| 312.232***| 381.283*** | 475.536*** | 475.536*** | 475.536*** | 475.536***|
| Log Likehood         | -9529.879 | -9495.353 | -9448.227 | -9448.227 | -9448.227 | -9448.227|
| AIC                  | 19069.757 | 19004.707 | 18918.454 | 18918.454 | 18918.454 | 18918.454|
| AICc                 | 19069.817 | 19004.819 | 18918.719 | 18918.719 | 18918.719 | 18918.719|
| BIC                  | 19094.341 | 19039.124 | 18972.538 | 18972.538 | 18972.538 | 18972.538|

Note. *p ≤ .05; **p ≤ .01; ***p ≤ .001.
Table 5. Negative binomial sequential regression with the average distance between the victim’s residence and the offender’s residence as the dependent variable (N= 1009).

|                | Model 1 |               | Model 2 |               | Model 3 |               |
|----------------|---------|---------------|---------|---------------|---------|---------------|
|                | $\beta$ | S.E.          | $\beta$ | S.E.          | $\beta$ | S.E.          |
| Residential    | -.255** | 0.085         | -.223** | 0.085         | -.202*  | 0.091         |
| Commercial     | -.336*  | 0.146         | -.338*  | 0.146         | -.366*  | 0.146         |
| Outdoor        | .022*   | 0.086         | 0.045   | 0.087         | 0.04    | 0.089         |
| ECR            | -.280***| 0.065         | -.281***| 0.065         | -.276***| 0.072         |
| Deserted place | -.264***| 0.066         | -.262***| 0.066         | -.263***| 0.066         |
| Compensatory   | .167**  | 0.064         |         |               | .191**  | 0.065         |
| Domestic activities/sleeping |         |               | 0.075   | 0.102         |         |               |
| Traveling/driving |        |               | .464*** | 0.109         |         |               |
| Socializing with friends |        |               | 0.202   | 0.180         |         |               |
| Prostitution   | .302*   | 0.124         |         |               |         |               |
| Constant       | 9.755***| 0.095         | 9.656***| 0.102         | 9.540***| 0.107         |

Likelihood Ratio Chi$^2$ 53.366*** 60.081*** 84.876***
Log Likehood -10429.089 -10425.732 -10413.334
AIC 20870.178 20865.464 20848.669
AICc 20870.262 20865.576 20902.752
BIC 20899.679 20899.881 20902.752

Notes. *$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.  

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## Appendix

Table A.1. Two-step cluster solution for offender motivation type ($N = 1009$).

|                          | Compensatory | Angry/Power | Opportunistic | Sadistic | $X^2$ |
|--------------------------|--------------|------------|---------------|----------|-------|
|                          | $n$          | $\%$      | $n$           | $\%$     | $n$   | $\%$ |
| Offender familiar with the crime scene | 49           | 11.89%    | 151           | 46.60%   | 202   | 100.00% |
|                          | 34           | 47.89%    |                |          |       |       |
| Offender targeted his victim | 0           | 0.00%     | 187           | 57.72%   | 0     | 0.00% |
|                          | 17           | 23.94%    |                |          |       |       |
| Conning (non-coercive) approach | 267         | 64.81%    | 114           | 35.19%   | 154   | 76.24% |
|                          | 40           | 56.34%    |                |          |       |       |
| Offender used blitz (coercive) approach | 0           | 0.00%     | 172           | 53.09%   | 0     | 0.00% |
|                          | 18           | 25.35%    |                |          |       |       |
| Victim was tortured | 0            | 0.00%     | 0             | 0.00%    | 71    | 100.00% |
|                          | 0            | 0.00%     |                |          |       |       |
| Anal penetration | 130          | 31.55%    | 101           | 31.17%   | 78    | 38.61% |
|                          | 38           | 53.52%    |                |          |       |       |
| Psychological terror | 6            | 1.46%     | 10            | 3.09%    | 4     | 1.98% |
|                          | 9            | 12.68%    |                |          |       |       |
| Severe/extreme physical injury | 25           | 6.07%     | 33            | 10.19%   | 17    | 8.42% |
|                          | 16           | 22.54%    |                |          |       |       |
| Base N                  | **412**      | **324**   | **202**       | **71**   |       |       |

Note. **$p \leq .01$; ***$p \leq .001$.**