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Comparing Crime Scene Trajectories: Sexual Versus Nonsexual Serial Homicides

A Thesis Presented in Partial Fulfillment of the Requirements for the Degree of
Master of Art in Forensic Psychology

John Jay College of Criminal Justice City University of New York Department of Forensic Psychology,

John Jay College of Criminal Justice CUNY

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Comparing Crime Scene Trajectories: Sexual Versus Nonsexual Serial Homicides

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This Thesis has been presented to and accepted by the Office of Graduate Studies,
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Abstract

When faced with a possible serial offender, crime linkage analysis is crucial in identifying which crime scenes belong to the same offender. Thus, when analyzing behavioral consistency to link crimes, it is essential to use a classification model that is empirically tested and is based on the type of crime being investigated. Several classification models examine patterns of consistency and change using a combination of thematic and behavioral subgroups; however, they are tested using sexual and nonsexual crime scenes, which some recent literature argues are two distinct types of homicide and should be examined separately. The present study tests the theoretical assumption that sexual and nonsexual homicides are different enough to warrant a separate examination by (1) comparing the occurrence of salient behaviors between sexual (n = 47 crime scenes, 11 unique offenders) and nonsexual (n = 31 crime scenes, 7 unique offenders) crime scenes; (2) comparing their themes of behavior; and (3) using the Model for the Analysis of Trajectories and Consistency in Homicide (MATCH) (Salfati & Sorochinski, 2019) to compare the patterns of thematic change and behavioral consistency. The results show that sexual and nonsexual serial homicide offenders differ in their crime scene actions and behavioral themes. The psychological implications and future directions are discussed.

Keywords: serial homicide, sexual homicide, nonsexual homicide, classification, behavioral consistency, behavioral change

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Comparing Crime Scene Trajectories: Sexual Versus Nonsexual Serial Homicide

When faced with a possible serial offender, crime linkage analysis is crucial for identifying which crimes are linked to the same offender. Though forensic evidence is recognized as the most useful for case linkage, it is often expensive, time-consuming, and may not always be present at a crime scene, unlike behavioral evidence (Labuschagne, 2014; Salfati, 2008). Crime linkage via behavioral analysis provides additional information for law enforcement to help save time and resources in the apprehension of an offender. Therefore, it is critical to analyze behavioral consistency appropriately when linking crimes. Crime linkage analysis via behavioral evidence is possible by completing a series of steps: (1) understand the type of crime under investigation; (2) identify the salient behaviors present at the crime scene that are relevant to the type of crime under investigation; (3) group the salient behaviors to the theme(s) specified in the classification model (next step); (4) apply the most valid and reliable classification model that will be used as a tool to link the offenses; (5) link the crimes that contain the same dominant theme; and (6) examine how the behavioral themes are changing throughout the offender's series to understand potential future offenses and understand the series as a whole. Each step will be closely considered in this study to examine the applicability of a classification model for sexual and nonsexual serial homicide while simultaneously comparing the homicide types at different stages of the linkage process.

Sexual and Nonsexual Homicide: Understanding the Legal and Psychological Perspectives

Serial homicide is a rare occurrence, estimated to be comprised of less than 1 percent of all homicides (Federal Bureau of Investigations [FBI], 2008), and most serial homicides are sexually motivated, making up about 65% of serial homicides (McKinley & Petherick, 2021; Smith et al., 2011). According to the Uniformed Crime Reporting (UCR) statistics, in 2019, 16,425 of 1,203,808 violent crimes in the United States were murder and nonnegligent manslaughter, and 1,565 of those victims were part of a series of murders (FBI, 2020, table 1 and expanded homicide data table 1). Homicide is a broad definition that is legally defined as the act of killing one person by another, including legal and illegal killings. The law recognizes criminal homicide as a violent crime for cases of murder (presence of *mens*

rea, guilty mind) and nonnegligent manslaughter (without *mens rea*) (FBI, 2011). Although there is no legal distinction between sexual and nonsexual homicides in the United States, researchers for the FBI have explicitly limited sexual homicide to being homicide containing one or more of the following elements: the victim's sexual parts are exposed; the victim's attire is suggestive of sexual interaction; the victim is positioned sexually; foreign object penetration of victim's cavities; evidence of sexual penetration; evidence of substitute sexual activity, interest, or sadistic fantasy (Burgess et al., 1986; Chopin & Beauregard, 2019; FBI, 2008; Sewall et al., 2013; Ressler et al., 1988). This study understands sexual homicide as defined by the FBI, without looking into sexual fantasy, due to the amount of subjective reasoning it requires.

Sexual and Nonsexual Serial Homicides are Two Distinct Types of Offenses

A study by Langevin et al. (1988) found more similarities than differences between sexual and nonsexual single homicide offenders. The differences include their demographics, marital status, substance abuse, history of violence, and brain pathology. However, several studies have found differences between sexual and nonsexual homicide regarding their crime scene behavior (Harbort et al., 2001) and crime themes (Myers et al., 2006). In Myers et al. (2006), the authors conclude that serial sexual homicide offenders commit their crimes mainly in pursuit of sadistic pleasure, and secondarily seek power and control over victims. Examining serial sexual homicide offenders in comparison with serial nonsexual offenders in Germany, Harbort and Mokros (2001) found that sexual homicide offenders favored a manual method of killing, such as strangulation or stabbing. In contrast, nonsexual serial homicide offenders typically killed their victims using a weapon and did not have physical contact with the victim. Furthermore, serial sexual homicide offenders were younger at the time of their offense and exhibited minimal consistency in their crime scene behaviors.

Similar to serial homicides, researchers have also found that single sexual and nonsexual serial homicides are different enough to be examined separately (e.g., Chopin & Beauregard, 2019; Skott et al., 2021). Chopin and Beauregard conclude that sexual murderers are so unique compared to nonsexual murderers and sexual assaulters that it is worth gathering knowledge about sexual murders separately.

Skott et al. (2021) found that sexual and nonsexual single homicide offenders are different in various aspects related to the offender, the victim, and the homicide. Most importantly to this study, Skott et al. found that sexual homicide offenders kill their victims by strangulation and nonsexual homicide offenders killed people they knew. In Carter et al (2017), the authors found that victims of sexual homicides had more violent injuries, were more often strangled and bound, were wounded using a combination of methods, and the victims were just as likely to know the offender than not know them.

Although several studies support differences in behaviors and themes between sexual and nonsexual serial homicides, the modern literature examines concepts of behavioral consistency using a mixed group of sexual and nonsexual serial homicides. In Salfati and Taylor (2006), the authors examined behavioral differences and similarities between sexual homicide and rape and used an intra-domain approach to determine whether the two types of offenses are specialized types of crime or, distinct types of crime within a greater pattern of behavior. The authors conclude that researchers should look beyond legal definitions and motivations when aiming to understand sexual violent crimes, and instead, understand the sexual element as a level of aggression. Much of the investigative psychology literature examining sexual and nonsexual homicide follow this approach and examine the two types together under the same classification system; the sexual element that typically is viewed as a distinguishing component is instead looked at as another way of expressing aggression.

Although Salfati and Taylor's approach may help understand violent sexual offenders in a general approach, this may cause conclusions to be generalized to both homicide types, even though the findings may be based more so on one offender type than the other. For example, Trojan and Salfati (2011) examined sexual and nonsexual serial homicides within the same study and found only one-third of serial homicide offenders demonstrated thematic consistency between their prior offending and current homicide behaviors, suggesting the psychological construct of consistency is found within a small portion of the serial homicide offenders. However, it was not specified if this was found within sexual or nonsexual serial homicide offenders. Based on Harbort and Mokros's (2001) study (which found nonsexual homicide offenders to be more consistent across crimes than sexual homicide offenders), it

may be the nonsexual homicide offenders who were more consistent in their behaviors, who also make up one-third of serial homicide offenders (Smith et al., 2011). Considering this, it is important to investigate if the two offender types also differ in the themes most used to link serial crimes. More specifically, it is valuable to know if the themes or set of variables used to link one type of serial homicide is just as effective to link another type of homicide. Furthermore, this study will examine how the two offender types present themselves differently within the same model, so we can gain a better understanding of how the two offenses may be psychologically similar or different.

Process of Linking Crimes

Identifying Salient Behaviors Found at the Crime Scene

The number of serial homicide cases reported in one year highlights the importance of linking crimes swiftly and accurately that belong to a series to apprehend a serial offender (FBI, 2020). Crimes are linked when they contain behavioral similarities, but when cases contain vastly different behaviors, they may be categorized as unlinked (Tonkin et al., 2017). The salient features (i.e., crime scene actions that are identified as important in research for offender differentiation) used to link crimes are dependent on the type of offense (e.g., salient crime scene features for serial rape can be different from those of serial homicide) (Canter, 2000). In investigative psychology, behavioral consistency pertains to determining the presence of and examining an individual's consistency of salient crime scene features across a series of crimes. For crime linkage utilizing behavioral evidence to be effective, an offender's behavior must be similar enough to be recognized across other crime scenes, yet unique so that it may be distinguished from other offenders' behavior (Woodhams & Bennell, 2014). For research to be accurate in which crime scene features are salient, studies looking at saliency to link crimes should be doing so using the same type of offense. However, two different crime scene types can display precisely the same behaviors and themes (Higgs et al., 2017) (e.g., the salient features and themes in nonsexual homicide can be present in sexual homicide). This study will examine in more detail the similarities and differences so we can fully understand whether models are generalized (as per Salfati and Taylor's, 2006 suggestion) or

whether they are more usefully examined separately (as suggested by others e.g., Chopin & Beauregard, 2019; Skott et al., 2021).

Using the Salient Behaviors to Identify Themes

When linking a series of crimes to a single offender, investigative psychology goes beyond looking at specific crime scene behaviors to, instead, group the salient crime scene behaviors based on psychological similarities to identify a *behavioral theme*. By removing the focus on individual behaviors, crime linkage cannot be compromised from one discontinued behavior, since themes allow for a broader perspective of each crime scene, whereas individual behaviors may appear and reappear unreliably due to external variables. Once a behavioral theme is identified at a crime scene, subsequent crimes can then be examined to identify thematic similarities or differences.

Salfati's (2019) review highlights the most salient thematic dimensions for linking serial homicides: (1) instrumental and expressive aggression (distinguished by their goals or the rewards they offer the perpetrator); (2) interpersonal themes (relating to how an offender may interact with the victim based on the psychological meaning they may assign to the victim, which includes the sexual element of the crime); (3) wounding behaviors (to examine different ways in which the offender may use violence, notably to control or to simply cause harm); and (4) planning behaviors (as a more detailed examination of how the offender may control the crime scene). These themes have been used consistently in investigative psychology for the construction of classification models.

Using Classification Models to Identify Dominant Themes

There are several classification models made to date, each designed with a different purpose using different themes. One of the most well-known models is the Organized/Disorganized classification model, developed by the FBI in 1986 (FBI, 2011). In investigative psychology, a classification model is a tool used to determine which behavioral theme is better represented at a crime scene, based on the salient crime scene features. Using a classification model to find the theme of each crime scene helps identify whether a crime is linked or unlinked via behavioral consistency and distinctiveness. Studies have supported the effectiveness of behavioral consistency and distinctiveness in cases of serial homicide

(Woodhams et al., 2019; Salfati and Sorochinski, 2019; Salo et al., 2013; Santtila et al., 2008). The literature comparing the behavioral consistency of sexual and nonsexual serial homicide offenders has found the two homicide types difficult to distinguish because while there may be no physical evidence of sexual assault, the homicide could have still been motivated by sexual drives (Salfati, 2008; Schlesinger, 2007). Further, the overt sexual indicators that do differentiate the two offenses are not reliable variables for crime linkage using behavioral consistency (except for oral sex by the victim; Bateman & Salfati, 2007). Considering these findings, studies often examine the two homicide types conjointly when testing models of classification to link serial crimes (e.g., Salfati, 2019; Salfati et al., 2008; Santtila et al., 2008).

Sorochinski and Salfati's (2010) homicide classification model uses important themes for identifying behavioral consistency that can be present in both sexual and nonsexual serial homicides (Salfati, 2019). In their study, the authors constructed a classification model that identifies behavioral themes based on the objective crime scene actions in serial homicides, including sexual and nonsexual behaviors for the purpose of crime linkage. The behavioral themes used in their model are based on the most salient crime scene features discussed in the literature. Their model identifies three behavioral themes, each with two subgroups that can be present in both homicide types: (1) Planning behaviors; the variables in this theme make up crime scene behaviors that represent pre-offense planning (e.g., avoided forensic evidence) and post-offense planning (e.g., staged the crime scene). (2) Wounding behaviors; the variables in this theme make up crime scene behaviors that represent goal-oriented killing methods (i.e., quick kill methods) and process-oriented killing methods (i.e., slow kill methods). (3) Victim-offender interaction; the variables in this theme make up crime scene behaviors that represent the victim's level of significance to the offender such as victim as object (i.e., the victim is a byproduct of what the offender is after) and victim as vehicle (i.e., the victim is significant to the offender). The victim-offender interaction theme did not display the victim as a person theme as described in Canter (2000), and as a result, the victim-offender interaction theme was reworked. Some of the variables that belonged to the victim as object theme (based on Canter, 2000), were reinterpreted to the victim as vehicle subtheme and vice-versa, based on the variable co-occurrences. Further, with the removal of the victim as a person

theme, some of the variables that would have been used for this theme were instead reinterpreted to the other subthemes, based on how they co-occur with other variables. Due to the implications of this, more recent literature (e.g., Sorochinski & Salfati, 2017; Sorochinski & Salfati, 2018) examines the interpersonal model as presented in Canter (2000). This study will follow the interpersonal model as presented in Sorochinski and Salfati (2010) since this model is based on sexual and nonsexual serial homicide offenders and see how the two groups may classify differently when applying the model separately.

Behavioral Trajectory: Examining the Change in Behavioral Themes Throughout an Offender's Series

While exact thematic behavioral consistency can be very useful for identifying a series, there are limitations. For instance, not all offenders remain consistent throughout their series, and they may change their behavior for various reasons (e.g., situation-induced learning, experimentation, gain, or loss of control, unexpected situational factors) (Chopin et al., 2020; Davies, 1991; Edelstein, 2016; Keppel, 2000), which may be problematic for linking based on behavioral consistency alone (Beauregard et al., 2007; Beauregard et al., 2008; Salfati, 2000). To investigate this problem, emerging research has focused on underlying patterns of consistency in offenders' crime scene themes (Salfati, 2010; Salfati 2019). Salfati's (2019) literature review consolidates the literature on serial homicide crime linkage and concludes that only a small number of studies aim to understand how themes of behavior change throughout an offender's entire series. Although some studies examine behavioral change in serial homicides (Salfati, 2019 discusses this in full); studies that look at this and make conclusions on sexual and nonsexual homicides separately are scant (e.g., Harbort & Mokros, 2001; McKinley & Petherick, 2021).

The literature has found a way to examine these patterns of inconsistencies to improve case linkage and increase the overall ability to link serial offenses (Woodhams & Bennell 2014; Salfati, 2019; Salfati & Sorochinski, 2019). For example, Salfati and Sorochinski's (2019) Model for the Analysis of Trajectories and Consistency in Homicide (MATCH) system takes classification models to a higher level by looking at how themes of behavior change or remain consistent throughout an offender's series (i.e.,

trajectory patterns). The authors found that the MATCH system improved the linkage accuracy by 30% compared to traditional methods that exclusively link crimes via behavioral consistency. This process involves examining crime scenes with hybrid themes and defining an offender's series based on the patterns of themes they exhibit. MATCH was developed and tested using a classification model with three subtypes. MATCH conceptualizes six distinct trajectories of behavioral patterns that offenders engage in throughout their series:

- (1) Consistent Pure – each crime scene displays the same dominant classification subtype.
- (2) Consistent Hybrid – each crime scene is the same hybrid subtype.
- (3) Pure Type Switcher – the offender switches between two dominant crime scene classification subtypes throughout their series.
- (4) Pure Type-Hybrid Switcher – each crime scene is either the same dominant subtype or the same hybrid subtype.
- (5) Double Pure Type-Hybrid Switcher – the series contains two different dominant themes and a hybrid(s) made up of the two subthemes.
- (6) Inconsistent – describes a series where no discernible pattern can be made.

Present Study

Despite the several studies supporting psychological and behavioral differences between sexual and nonsexual homicides, numerous studies still examine the two homicide types within the same classification system. The research suggesting that sexual and nonsexual serial homicide should be considered two distinct types of offenses prompts us to further understand the conclusions made in studies that conjointly examine the offenders' behavioral patterns. Furthermore, it is important to understand how the two homicide types may present themselves differently when examining themes of behavior necessary to link serial crimes; and if the two offender types differ to the extent to which both homicides should be examined and tested separately.

Determining if a difference exists between sexual and nonsexual serial homicides requires a comparison using crime scene features that can be present in both types of homicide and using an

empirically based classification model constructed for both homicide types. Using one classification model to separately examine two types of homicides will aid in understanding if one model can be used to examine different types of homicides. Sorochinski and Salfati's (2010) study was chosen because it includes the crime scene features that the literature has suggested are the most salient and are based on serial homicide. As such, it provides a solid basis to examine how the two homicide types may differ, the implications this has on classification, and ultimately how this impacts consistency analysis. Although Sorochinski & Salfati's (2010) model contains variables that are exclusive to sexual homicides, there were no empirically tested models found that examine the two homicides using only variables possible in both homicide types.

Aims: Comparing Sexual and Nonsexual Serial Homicides

The present study aims to understand the differences between sexual and nonsexual serial homicides by comparing: (1) the specific crime scene behaviors; (2) their themes of behavior; and (3) the consistency of thematic behavior throughout an offender's series. By comparing each of the three levels, an encompassing understanding of the homicide types can be achieved.

1. The first aim of this study compares the frequency of salient behaviors between sexual and nonsexual serial homicide. The purpose of this aim is to identify the behaviors that are prevalent in each homicide type and to examine similarities and differences in order to further understand what components of the crime make these two types of homicide similar or dissimilar.
2. The second aim compares sexual and nonsexual serial homicides on their thematic display of behavior at the crime scene. Using the classification model proposed by Sorochinski and Salfati (2010), this aim will investigate the psychological differences between sexual and nonsexual serial homicide offenders pertaining to planning, wounding behaviors, and interpersonal focus.
3. The third aim examines how the themes (identified in aim 2) change or remain consistent throughout the offenders' series (i.e., compare trajectory patterns). This comparison will utilize the MATCH model (Salfati & Sorochinski, 2019), which provides a classification system to identify trajectory patterns in a series based on the thematic evolution of the offender's series.

Methods

Sample: Sexual and Nonsexual Serial Homicides

The present study aims to determine possible differences between sexual and nonsexual homicide offenders; thus, this study will strictly be looking at sexual or nonsexual cases and exclude series that have a mix of both. Offenders who have at least one sexual indicator (i.e. the victim's sexual parts are exposed; victim's attire is suggestive of sexual interaction; the victim is positioned sexually; foreign object penetration of victim's cavities; evidence of sexual penetration; evidence of substitute sexual activity) in each crime scene will be classified as serial sexual homicide offenders. Offenders who have no sexual indicators across all crime scenes will be classified as serial nonsexual homicide offenders. Though serial homicide constitutes two or more offenses committed by the same offender (FBI, 2008), in order to examine consistency and change across a series, the present study will examine up to the first five crime scenes committed by a single serial offender (minimum of three, if there are fewer than five). Examining the first five crime scenes provides sufficient information to understand the trajectory of a serial offender. If there are less than five cases in a series, it is important to examine all that is available to fully understand the potential trajectory of an offender. However, a series with only two crime scenes cannot provide enough information to understand any pattern (Salfati & Sorochinski, 2019). Examining crime scenes of different lengths can limit the reliability and validity of the third aim by adding more variance to the comparison (e.g., homicide expertise). One option to absolve this would be to examine only the first three crime scenes of each offender's full series, regardless of series length, but this would not provide enough information to accurately detect the Double Pure Type-Hybrid Switcher and Inconsistent Type patterns in the longer series (as described by MATCH; Sorochinski & Salfati, 2019).

Database

The data utilized for this study originates from the Salfati (2015) Homicide and Rape Database which is based on crime files from the John Jay College of Criminal Justice and FBI Behavioral Research and Instruction Unit Collaborative Research Project. The data was taken from closed, fully adjudicated state and local cases that were contributed by law enforcement agencies from around the country for the

purpose of research. All identifiers, including names of victims, suspects, offenders, officers, departments, and correctional agencies, are removed, and only aggregate data are reported. The sample used in Sorochinski and Salfati's (2010) study comes from an older version of the data set used in this study (Salfati, 2015). Thus, some of the offenders used in this study may be the same as the ones used in Sorochinski and Salfati's (2010) study. The authors of this study were not able to determine how many cases were also used in their model. Among the 1,324 homicide and rape crime cases in the database, 140 are serial homicide cases resulting from 32 serial homicide offenders, each with a series of various lengths ($R = 10-2$; $M = 4.29$; $SD = 2$). Serial offenders who were not strictly sexual or nonsexual in each of their crime scenes were excluded from this study. If the offender had more than five crime scenes, the other crime scenes were also reviewed, and the case descriptor was read to ensure that the offender was in the correct classification. Inclusion criteria allowed for 18 serial homicide offenders (serial sexual $n = 11$; serial nonsexual $n = 7$), resulting in 78 total crime scenes of various lengths (serial sexual crime scenes $n = 47$; series length, $R = 5-3$; $M = 4.27$; $SD = 0.9$) (serial nonsexual crime scenes $n = 31$; series length, $R = 5-3$; $M = 4.42$; $SD = 0.78$). The average length and standard deviation of the series in this study's sample are close across both homicide types, suggesting both homicide types have similar proportions of three, four, and five-length crime scenes.

The cases in the Salfati (2015) Homicide and Rape database have been coded using Salfati's (2010) Homicide Profiling Index – Revised to Include Rape and Sexual Offenses (HPI-R©). The HPI-R© is a coding dictionary that is used as a tool to collect data from police records, it is also the latest edition of the Homicide Profiling Index (Salfati, 2010). The HPI-R© is composed of 312 dichotomous and interval variables divided into six sections: case file contents, pre-crime behaviors, crime scene behaviors, post-crime behaviors, victimology, and offender background (Salfati, 2010).

Study Variables

The comparison between sexual and nonsexual serial homicide offenders will be based on the variables identified in the homicide classification model, by Sorochinski and Salfati (2010). The variables in this model are based on the crime scene features determined to be the most salient for identifying

behavioral consistency in serial homicide offenders (see table 1). Table 1 outlines the variables in the homicide classification model and their respective subthemes. The collected crime scene actions occurred before, during, and after the crime to classify the crime under the totality of the circumstances. Furthermore, actions that specifically focused on the cognitive element such as pre-planning and post-planning behaviors, as well as the nature of the violence and cause of death were used in the construction of their model as well (Soroichinski & Salfati, 2010).

Table 1. Variables Used in Soroichinski & Salfati's (2010) Classification Model

Planning Behaviors		Wounding Behaviors (Instrumental v. Expressive)		Victim-Offender Interaction Behaviors		
<i>Pre-Planning</i>		<i>Process-Oriented</i>		<i>Victim as Object</i>		
Crime occurred during the day (daytime)	Preparatory actions (preact)	Injury to torso (toroInjry)	Bitten (bite)	Body covered post-mortem (coverpm)	Wounding post-mortem (woundpm)	Masturbation at the scene (masturbation)
Body found inside (inside)	Forensic evidence avoided (awareavoid)	Multiple wounds distributed (multdist)	Drowned (drown)	Face covered post-mortem (faccovpm)	Victim bound post-mortem (boundpm)	Body redressed post-mortem (redressed)
Weapon brought to scene (weapto)	Evidence of forced entry (forceent)	Injury to neck strangulation (neckstra)	Injury to pelvis (injpelv)	Male victim (male)	Blood-related victim (bloodreltv)	Necrophilia (necro)
Body found in victim's residence (vicres)	Body found at the murder site (bodyatsite)	Manual strangulation (manstrang)	Ligature strangulation (ligstran)	Body posed (posbodpm)	Past relationship with victim (pastrela)	
		Stabbing (stabbing)		Child victim (child)	Evisceration (evisce)	
<i>Post-Planning</i>		<i>Goal-Oriented</i>		<i>Victim as Vehicle</i>		
Staged crime scene (stage)	Body transported (transportpm)	Shot (shot)	Stabbed neck (neckstab)	Bound (bind)	Transient victim (transient)	Oral penetration (oral)
Body found in offender's residence (offres)	Revisited crime scene (revisited)	Asphyxia (asphyxia)	Injury to face (injface)	Present relationship with the victim (relation)	Blindfolded (blind)	Vaginal penetration (vagpent)
Removed Forensic evidence (awareremove)	Spent time at the crime scene (spendtime)	Blunt instrument (bluntins)	Injury to head (injhead)	Elderly victim (eldv)	Gagged(gag)	Anal penetration (analpent)
				Prostitute victim (prostitute)	Threatened with a weapon (weapthreat)	Penetration with foreign object (pentforein)
				Acquaintance victim (knew)	Dismemberment (dism)	

Results

Aim 1: Comparing the Prevalence of Salient Crime Scene Features Between Sexual and Nonsexual Serial Homicides

Knowing which crime scene features are prevalent in sexual and nonsexual homicides will aid in understanding the ways in which sexual and nonsexual serial homicides are similar and different. This study first compared the frequency of salient crime scene features identified in the homicide classification model (Soroichinski & Salfati, 2010) between sexual and nonsexual serial homicide, in order to identify the behaviors that are more prevalent in each homicide type. The sample used for this aim consisted of 18 offenders and 78 crime scenes. The comparison between sexual (sexual indicators in every crime scene in the series; n = 11 offenders; n = 47 crime scenes) and nonsexual (no sexual indicators in any crime scene in the series; n = 7 offenders; n = 31 crime scenes) serial homicide offenders is based upon the first five crime scenes (or less if there are fewer than five). Each of the 78 crime scenes was examined across 55 crime scene features. The sexual variables were also included in the comparison to ensure that no nonsexual homicide offenders contained a sexually exclusive variable and to examine the frequencies of the sexually exclusive variables in serial sexual homicides. Incorporating the sexual variables into the analysis will provide information on the frequencies of behavior for each victim-offender subtheme. Knowing if the sexual homicide offenders are exhibiting behaviors for only one of the subthemes is important to consider for the next aim, which compares the offenders by their themes of behavior. Then, each crime scene feature was cross-tabulated by homicide type and tested for significance using Pearson's chi-square test of independence (see table 2).

Table 2. Comparing Crime Scene Features Between Sexual and Nonsexual Serial Homicide

Salient Crime Scene Feature	Serial Homicide Type (N = 78)		χ^2
	Sexual Homicide n = 47(%)	Nonsexual Homicide n = 31(%)	
Planning Behaviors			
Body found at the murder site	13(27)	21(67)	12.205***
Body found inside	7(15)	22(71)	25.147***
Spent time at the crime scene	7(15)	16(51)	12.113***
Weapon brought to the scene	16(34)	5(16)	3.047
The crime occurred during the day	7(15)	10(32)	3.304
Body found in offender's residence ²	6(12)	9(29)	3.182
Forensic evidence removed ²	4(8)	6(19)	1.965
Forensic evidence avoided ²	3(6)	5(16)	1.928
Body found in victim's residence	1(2)	6(19)	6.786
Revisited crime scene ²	2(4)	4(13)	1.967
Staged crime scene ²	1(2)	5(16)	5.157*
Preparatory acts ²	0(0)	5(16)	8.1**
<i>Body transported post-mortem¹</i>	0(0)	0(0)	
<i>Evidence of forced entry¹</i>	0(0)	0(0)	
Wounding Behaviors			
Multiple wounds distributed	29(61)	6(19)	13.542***
Injury to neck strangulation	16(34)	12(38)	0.177
Injury to head	15(32)	12(38)	0.381
Injury to face	19(40)	5(16)	5.177*
Injury to torso	19(40)	2(6)	10.959***
Manual strangulation	13(27)	8(26)	0.033
Blunt instrument	12(25)	7(22)	0.088
Stabbing ²	11(23)	1(3)	5.843**
Injury to pelvis ²	9(19)	0(0)	6.710*
Asphyxia ²	6(12)	3(9)	0.174
Ligature strangulation ²	3(6)	5(16)	1.928
Shooting ²	3(6)	5(16)	1.928
Stabbing to the neck ²	5(10)	0(0)	3.524
Biting ²	2(4)	0(0)	0.3333
<i>Drowning¹</i>	0(0)	0(0)	

Continuation of Table 2. Comparing Crime Scene Features Between Sexual and Nonsexual Serial Homicide

Salient Crime Scene Feature	Serial Homicide Type (N = 78)		χ^2
	Sexual Homicide n = 47(%)	Nonsexual Homicide n = 31(%)	
Victim-Offender Interaction Behaviors			
Child victim	16(34)	6(19)	1.99
Bound	16(34)	2(6)	8.011**
Male victim	14(29)	3(9)	4.432*
Threatening with weapon	12(25)	5(16)	0.969
Prostitute victim	8(17)	8(26)	0.884
Body posed	8(17)	6(19)	0.069
Body covered post-mortem ²	2(4)	10(32)	11.252***
Acquaintance victim ²	2(4)	8(26)	7.762**
Wounding post-mortem ²	7(15)	0(0)	5.072*
Dismemberment ²	4(8)	2(6)	0.112
Blood-related victim ²	0(0)	5(16)	8.1**
Present relationship ²	0(0)	5(16)	8.1**
Gagged ²	5(10)	0(0)	3.524
Blindfolded ²	4(8)	0(0)	0.153
Victim bound post-mortem ²	3(6)	0(0)	2.058
Elderly victim ²	0(0)	3(9)	4.730*
Face covered post-mortem ²	2(4)	1(3)	1
Transient victim ²	2(4)	0(0)	1.337
Vaginal penetration ²	15(32)	0(0)	9.102**
Body redressed post-mortem ²	14(29)	0(0)	7.98**
Anal penetration ²	7(15)	0(0)	5.072*
Oral penetration by offender ²	5(10)	0(0)	3.524
Penetration with foreign object ²	3(6)	0(0)	2.058
Masturbation at the scene ²	2(4)	0(0)	1.337
Necrophilia ²	2(4)	0(0)	1.337
<i>Evisceration</i> ¹	0(0)	0(0)	
<i>Past relationship with victim</i> ¹	0(0)	0(0)	

Note. * $p \leq .05$, ** $p \leq .01$ *** $p < .001$. ¹ Variables occurring once or none in each homicide were removed from the remainder of the study. ² Significance tested using Fisher's exact test.

The results revealed several low-frequency variables coming from all three themes. Following the work of Sorochinski and Salfati (2010), variables that occurred once or none will be removed from the remainder of the study, as they are too rare of an occurrence to make any meaningful conclusions. All of

the low-frequency variables removed are the variables that were also removed from the Salfati and Sorochinski (2010) (i.e., “drowning,” “blindfolding,” “past relationship with victim,” “evisceration,” “body redressed post-mortem,”) or, found to be low frequency but were not removed (i.e., “evidence of forced entry,”). There were some crime scene features that were removed from Sorochinski and Salfati’s study (2010) that were not removed from this study (i.e., “Staging the crime scene,” “Elderly victim,” “Blood-related victim,” and “Present relationship with victim”). The following aim will assess how these differences in variable frequency affect the validity of the model.

Planning behaviors: Serial nonsexual homicide offenders are more likely than serial sexual homicide offenders to leave the body at the murder site, $X^2(1, N = 78) = 12.2, p < .001$; leave the victim’s body indoors, $X^2(1, N = 78) = 25.1, p < .001$; spend time at the crime scene post-murder, $X^2(1, N = 78) = 12.1, p < .001$; stage the crime scene, $X^2(1, N = 78) = 5.1, p < .05$; and are more likely to take actions to prepare for the murder, $X^2(1, N = 78) = 8.1, p < .01$.

Wounding behaviors: Serial sexual homicide offenders are more likely than serial nonsexual homicide offenders to have multiple wounds distributed throughout the body, $X^2(1, N = 78) = 13.5, p < .001$; inflict injuries to the victim’s torso, $X^2(1, N = 78) = 10.9, p < .001$; likely to stab their victims, $X^2(1, N = 78) = 5.8, p < .01$; and inflict injuries to the victim’s torso $X^2(1, N = 78) = 12.2, p < .05$.

Victim-offender interaction behaviors: Serial sexual homicide offenders are more likely than serial nonsexual homicide offenders to have indicators of victim binding, $X^2(1, N = 78) = 8.01, p < .01$; are more likely to have male victims, $X^2(1, N = 78) = 4.4, p < .05$; and are more likely to continue to wound their victim after the victim is deceased, $X^2(1, N = 78) = 5.0, p < .05$. Serial nonsexual homicide offenders are more likely than serial sexual homicide offenders to leave the body covered after murdering the victim, $X^2(1, N = 78) = 11.252, p < .001$; are more likely to murder an acquaintance, $X^2(1, N = 78) = 7.7, p < .01$; are more likely to murder a blood relative, $X^2(1, N = 78) = 8.1, p < .01$; are more likely to murder their intimate partner, $X^2(1, N = 78) = 7.7, p < .01$; and are more likely to murder the elderly, $X^2(1, N = 78) = 4.7, p < .05$. There was a total count of 34 sexually exclusive variables present, stemming from the 11 serial sexual homicide offenders in this study.

Three of the seven sexually exclusive variables coded were statistically significant, namely vaginal penetration $\chi^2 (1, N = 78) = 9.102, p < .01$, victim redress post mortem $\chi^2 (1, N = 78) = 7.98, p < .01$, and anal penetration $\chi^2 (1, N = 78) = 5.072, p < .01$, however, this finding is artificial because the serial nonsexual homicide sample group was operationalized to not contain sexually exclusive variables in any crime scene. This comparison affirmed that no nonsexual homicide offenders contained a sexually exclusive variable and examined the frequencies of the sexually exclusive variables in serial sexual homicides. Furthermore, the frequencies show that there are a substantial number of sexually exclusive variables occurring in each of the victim-offender interaction subthemes.

Summary

Based on the frequency comparison between sexual and nonsexual serial homicides, several similarities and differences were observed. There are seven crime scene features that are significantly predominant in serial sexual homicides (injuries to the victim's face; multiple wounds throughout the victim's body; injuries to the victim's torso; stabbing; injuries to the victim's pelvic region; binding the victim; and wounding the victim after death) and 11 crime scene features that are more predominant in serial nonsexual homicides (victim's body found inside; found at the murder site; offender spent time at the crime scene after the murder; body found in offender's residence; crime scene was staged; preparatory actions were taken; the victim was family, friend, or a previous intimate partner; victim's body was covered postmortem; the victim was elderly). It is important to note that all the variables predominant in serial sexual homicides are also found within the wounding behaviors theme, whereas none of the variables that are significantly more present in nonsexual homicides pertain to wounding behaviors. Furthermore, the nonsexual serial homicides contained variables mostly contained within the planning behaviors theme.

The sexual element was included in the analysis in order to understand the frequencies of behavior for each victim-offender subtheme. This analysis showed that sexual homicide offenders exhibit behaviors in both victim as vehicle and victim as object subthemes. Although the results of the chi-square

test are artificial due to the sample selection, examining the sexual behaviors still allowed for an understanding of how the variables within the homicide classification model are presented in this sample.

The psychological similarities among the crime features predominantly found in serial sexual homicides reflect the concept of violence—serial sexual homicide offenders often attack their victims in nonvital areas, use several different means to injure their victims, and vary in their methods of killing. The variables predominant in serial nonsexual homicide reflect the concept of familiarity—serial nonsexual homicide crime scenes often kill within familiar situations and are not taking risks by committing the murder in unfamiliar ways. The following aims will further explore the difference in themes, which will allow further investigation as to how the psychological constructs of violence and familiarity are projected in cases of sexual and nonsexual serial homicide.

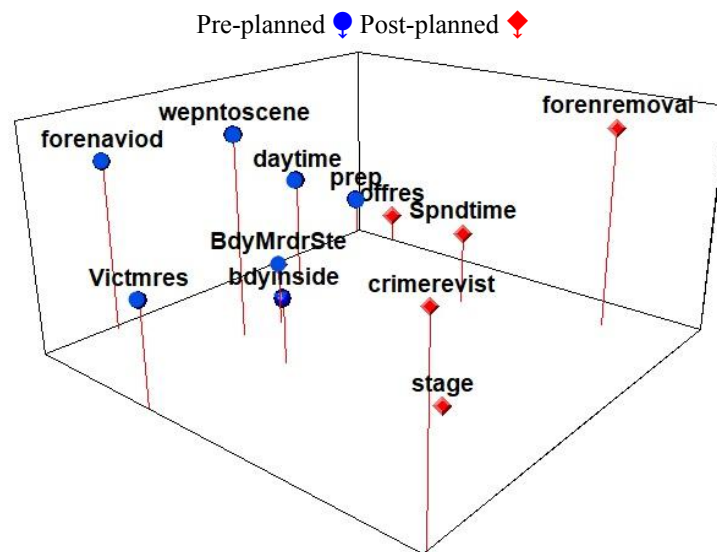
Aim 2: Testing the Classification Model & Comparing the Thematic Differences Between Sexual and Nonsexual Serial Homicides

Part 1: Testing The Homicide Classification Model (Sorochinski & Salfati, 2010)

The second aim compared the thematic associations between behavioral themes and serial homicide type. The first step of this aim was to determine if the thematic distinction within the homicide classification model (Sorochinski & Salfati, 2010) is found within the crime scenes of this study's sample. Following the methodological structure of Sorochinski and Salfati (2010), three Small Space Analyses (SSA) were utilized to confirm thematic divisions in each behavioral subgroup: (1) planning behaviors (pre-planning and post-planning); (2) wounding behaviors (process-oriented and goal-oriented); (3) victim-offender interaction theme (victim as an object and victim as a vehicle) (see figures 1, 2, and 3). SSA is a multidimensional scaling procedure that plots the points of each variable in relation to their co-occurrences with other variables within the data set (Shye et al., 1994). Variables frequently co-occurring together are plotted closer together and are theorized to represent a common underlying theme. SSAs have shown to be a valid hypothesis testing technique for identifying subgroups of themes (e.g., Salfati & Sorochinski, 2019). The coefficient of alienation is a measure of the nonassociation

between two variables and will be used as an indicator of how well the SSA result represents the relationship between variables in data. A value less than 0.2 indicates that the result accurately represents the relationship between all variables in the data provided. The sample of this aim is consistent with the sample from the previous aim, 18 offenders and 78 crime scenes. Any low-frequency crime scene features identified in the previous aim were removed from the analysis since the occurrences will be too unique to be useful in offender differentiation (Sorochinski & Salfati, 2010).

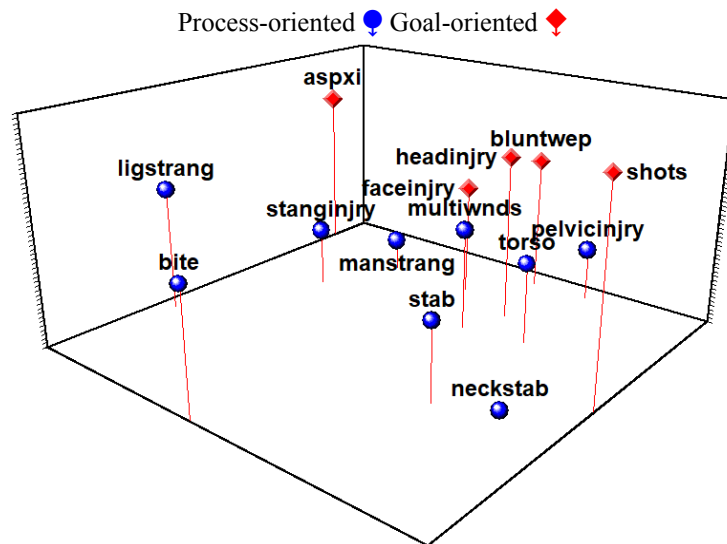
Figure 1. Examining Thematic Distinction: Planning Behaviors for Sexual and Nonsexual Serial Homicide Offenders



Note. The coefficient of alienation = .11180.

Planning Behaviors: The SSA of the 12 behaviors across the 78 crime scenes for the planning behaviors theme can be seen in figure 1. The coefficient of alienation was .11180 showing an excellent representation of the data in the three-dimensional plot. As can be seen from the patterns of co-occurring behaviors in the SSA, two spatially separate regions of co-occurring variables (pre-planned and post-planned), were evident. The two hypothesized subtypes of planning behaviors can be seen in the data that includes both sexual and nonsexual homicides. The occurrence of a thematic distinction supports this theme as a valid medium to compare sexual and nonsexual serial homicides' thematic differences and examine how each homicide type is psychologically related to the element of planning behaviors.

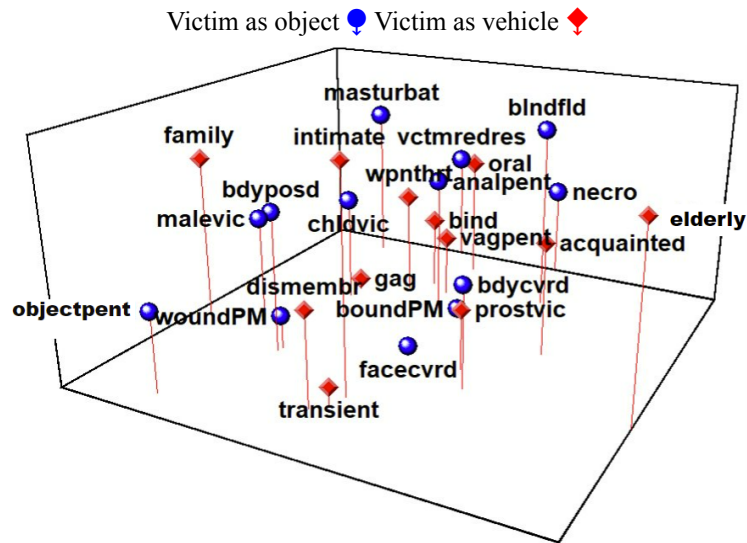
Figure 2. Examining Thematic Distinction: Wounding Behaviors for Sexual and Nonsexual Serial Homicide Offenders



Note. The coefficient of alienation = .08888.

Wounding Behaviors: The SSA of the 14 behaviors across the 78 crime scenes for the wounding behaviors theme can be seen in figure 2. The coefficient of alienation was .08888 signifying an excellent representation of the data in the three-dimensional plot. As can be seen from the patterns of co-occurring behaviors in the SSA, two spatially separate regions of co-occurring variables (process-oriented and goal-oriented), were clearly evident. The two hypothesized subtypes of wounding behaviors can be seen in the data that includes both sexual and nonsexual homicides. The thematic distinction also supports the usage of this theme as a valid medium to examine how the theme of wounding behaviors may psychologically present themselves within each homicide type.

Figure 3. Examining Thematic Distinction: Victim-Offender Interaction Behaviors for Sexual and Nonsexual Serial Homicide Offenders



Note. The coefficient of alienation = .08502.

Victim-Offender Interaction Behaviors: The SSA of the 25 behaviors across the 78 crime scenes for the victim-offender interaction behaviors theme can be seen in figure 3. The coefficient of alienation was .08502 signifying an accurate representation of the data in the three-dimensional plot. The results did not reveal a pattern of variables representing the same theme. This result suggests that the victim-offender interaction theme presented in Sorochinski and Salfati's (2010) model is not applicable to the data sample within this study. Since there was not a thematic distinction found in this result, this theme cannot be used as a medium to compare sexual and nonsexual serial homicides and therefore will be removed from the remainder of this study.

Part 2: Assessing Thematic Associations

By comparing the themes of behavior between the two homicide types, we can further our understanding of how the two homicide types may be thematically similar and different. The second part of this aim compared sexual and nonsexual serial crime scenes by their themes, which requires grouping the crime scene actions (outlined in table 2) into themes and comparing their thematic differences. Crime scenes were assigned a *dominant* (when the crime scene fits the criteria for only one subtheme) or *hybrid* theme (when the crime scene is an equal mix between two different subthemes within the same behavioral

theme), based on stringent criteria (Salfati, 2000, Trojan & Salfati, 2009; Sorochinski & Salfati, 2010). For each crime scene, the proportional score for each subtheme was calculated by dividing the number of observed variables by the total number of variables in the subtheme. The criterion for a dominant theme was met if the proportion score for one subtheme was twice the amount as the portion score for the alternative subtheme theme (Salfati, 2000). This stringent criterion was chosen because research strongly supports its use when using themes with only two subdivisions (Trojan and Salfati, 2009). Of the 78 crime scenes, 15 crime scenes in the planning theme (sexual = 15; nonsexual = 0) and 7 crime scenes in the wounding theme (sexual = 6; nonsexual = 1) contained less than two variables and were not given a theme, as there is too little information to classify a theme. Since a crime scene theme speaks to the psychology of the offense, it would not be sound to apply a psychological significance to an entire crime scene based only on one crime scene feature. After classification, each theme was cross-tabulated by sexual and nonsexual serial homicide. A Pearson chi-square test was performed to measure significance and Cramér's V analysis was used to measure the strength of association between the two categorical fields that are significantly different (see table 3).

Table 3. Comparing Thematic Differences Between Sexual and Nonsexual Serial Homicide

Planning Theme¹	Sexual Homicide (n = 30)	Nonsexual Homicide (n = 31)
Pre-planned	23	15
Post-planned	2	5
Hybrid	5	10
Wounding Theme²	Sexual Homicide (n = 41)	Nonsexual Homicide (n = 30)
Process-oriented	21	13
Goal-oriented	9	14
Hybrid	11	3

Note: ¹Fisher's exact test statistic value is 5.3. The result is not significant at $p < .05$. ²Fisher's exact test statistic value is 5.9. The result is significant at $p = .05$.

Planning Behaviors: A total of 61 ($n = 30$ sexual homicide, $n = 31$ nonsexual homicide) crime scenes were classified as either pre-planned ($n = 23$ sexual homicide; $n = 15$ nonsexual homicide), post-planning ($n = 2$ sexual homicide; $n = 6$ nonsexual homicide), or hybrid theme ($n = 5$ sexual homicide; $n = 10$ nonsexual homicide). Seventeen serial sexual homicide crime scenes were excluded for not having sufficient crime scene features to classify any theme (less than two features). The Pearson chi-square test for significance did not reveal any significant differences between sexual and nonsexual serial homicides $X^2(2, N = 61) = 5.3, p = .06$.

Wounding Behaviors: A total of 71 ($n = 41$ sexual homicide, $n = 30$ nonsexual homicide) crime scenes were classified as either process-oriented ($n = 21$ sexual homicide; $n = 13$ nonsexual homicide), goal-oriented ($n = 9$ sexual homicide; $n = 14$ nonsexual homicide), or hybrid theme ($n = 11$ sexual homicide; $n = 3$ nonsexual homicide). Six serial sexual homicide crime scenes and one serial nonsexual crime scene were excluded for not having sufficient crime scene features to classify any theme (less than two features). The Pearson chi-square test for significance revealed a significant difference between sexual and nonsexual serial homicides $X^2(2, N = 71) = 5.9, p = .05$ in their wounding themes. Cramér's V was used to determine the strength of the association. The effect size for this finding, Cramér's V , was small ($ES = .29$), suggesting that there is a small association between the type of crime scene and the thematic subtype that is displayed. The results suggest that nonsexual serial homicide offenders are more likely to inflict goal-oriented wounds on their victims, and sexual homicides are more likely to be hybrid.

Summary

The first part of this aim tested the applicability of the homicide classification model (Sorochinski & Salfati, 2010) to this study sample and compared the thematic differences between sexual and nonsexual serial homicides in planning and wounding behaviors. Although the two homicide types differ in their frequency of salient behaviors (as found in aim one), this aim found the homicide classification model to be applicable to both homicide types when using planning and wounding behavioral themes. The victim-offender interaction theme, as presented in Sorochinski and Salfati (2010), was not applicable to this sample because no thematic distinction could be identified. Without a clear separation amongst

variables that are hypothesized to co-occur, there is no support for the hypothesized subthemes of victim as object and victim as vehicle, and therefore the theme was removed from the remainder of the study.

The second part of this aim compared sexual and nonsexual serial homicide crime scenes using the supported themes within the homicide classification model (planning and wounding) (Soroichinski & Salfati, 2010). The results did not reveal a significant difference between the two homicide types in regards to planning behaviors, $p = .06$. However, the results did reveal a significant difference between the two homicide types in regards to their wounding behaviors subtheme expressions, $p = .05$. Although this association was weak, $ES = .29$, the results suggest that serial sexual homicide offenders may be more likely to fall under process-oriented or hybrid subthemes, whereas serial nonsexual homicide offenders may be more likely to engage in goal-oriented wounding behaviors compared to serial sexual homicide offenders

The psychological constructs applicable to what was observed in the first aim are also applicable to the observations of this aim. As mentioned in detail in the summary section of aim one, serial sexual homicide crime scenes reflect the psychological construct of violence while serial nonsexual homicide crime scenes reflect the psychological construct of familiarity. In this aim, the theme of violence was evident in the serial sexual homicide offender's wounding behaviors theme; particularly, they expressed higher levels of process-oriented theme, indicative of violent behavior and a longer killing process (Canter, 2000). The psychological construct of familiarity was seen in the fact that all 31 nonsexual crime scenes expressed some form of planning behavior, indicative of low-risk kills obtaining more control of the situation (Canter 2000; Canter & Youngs, 2009).

Aim 3: Comparing Crime Scene Trajectories Between Sexual and Nonsexual Serial Homicides

An important step to understanding the similarities and differences between sexual and nonsexual serial homicide offenders in areas pertaining to crime linkage analysis, is to compare their degree of behavioral consistency. The MATCH system by Salfati and Soroichinski (2019) labels an offender's crime series using a classification system that examines the themes for each crime scene and applies a label

based on the trajectory pattern observed. MATCH will be used to categorize each offender's series and compare how each series is showing consistency versus behavioral change. To address patterns of change and consistency, MATCH conceptualizes six distinct trajectory patterns that offenders can engage in throughout their series:

- (1) Consistent – when each crime scene in the series was one dominant subtheme (e.g., all crime scenes in the series were pre-planned).
- (2) Consistent Hybrid – when each crime scene in the series was a hybrid between two subthemes (e.g., all crime scenes in the series contained pre-planned and post-planned crime scene subthemes).
- (3) Pure Type Switcher – there are two dominant subthemes in the series, and there is no hybrid (e.g., the series contained at least one pre-planned and at least one post-planned crime scene subtheme).
- (4) Pure Type-Hybrid Switcher – the series contains at least one dominant subtheme and at least one hybrid crime scene (e.g., one pre-planned and one hybrid crime scene subtheme).
- (5) Double Pure-Hybrid Switcher – the series contains two different dominant themes and a hybrid(s) made up of the two subthemes (e.g., the series contained a pre-planned, post-planned, and hybrid crime scene subtheme).
- (6) Inconsistent – describes a series where no discernible pattern can be made. The Inconsistent series type was applied if, (a) a series with five crime scenes had two or more crime scenes with less than two variables; or, (b) a series with four crime scenes contained one crime scene with less than two variables and more than two different themes.

The third aim examined how the subthemes in planning behaviors (i.e., pre-planning and post-planning) and wounding behaviors (i.e., process-oriented and goal-oriented), change throughout an offender's series and examine the patterns of change in sexual and nonsexual serial homicide. The crime scenes were grouped to their respective serial offenders and arranged by date, to assist in understanding how the themes change over time. The sample of this aim is the same sample used in the previous aims, 18 offenders (serial sexual homicide offenders $n = 11$; serial nonsexual homicide offenders $n = 7$) and 78 crime scenes (serial sexual crime scenes $n = 47$; serial nonsexual crime scenes $n = 31$). A table was

created to summarize the comparison between sexual and nonsexual serial homicide in planning and wounding behaviors (see table 3). Fisher's exact test was used to test for significance and accounts for the unequal variance since both homicide groups do not have the same crime scene length.

Table 3. Consistency Patterns in Serial Homicide Offenders' Criminal Trajectory

Series Consistency Type	Planning Theme ¹		Wounding Theme ²	
	Sexual Homicide N (%)	Nonsexual Homicide N (%)	Sexual Homicide N (%)	Nonsexual Homicide N (%)
Exact Consistency	3 (37.5)	5 (71.4)	2 (18.18)	4 (57.2)
Consistent Pure	2 (18.18)	4 (57.14)	2 (18.18)	4 (57.14)
(a) <i>Process-oriented</i>	2 (18.18)	2 (28.5)	2 (18.18)	2 (28.5)
(b) <i>Goal-oriented</i>	0 (0)	2 (28.5)	0 (0)	2 (28.5)
Consistent Hybrid Type	0 (0)	0 (0)	0 (0)	0 (0)
Patterns of Change	5 (62.5)	2 (40.78)	9 (81.82)	3 (40.78)
Pure Type Switcher	1 (9.09)	1 (14.28)	1 (9.09)	1 (14.28)
Pure Type-Hybrid Switcher	5 (45.45)	2 (28.5)	5 (45.45)	2 (28.5)
(a) <i>Process-oriented</i> + <i>Hybrid</i>	4 (36.36)	1 (14.28)	4 (36.36)	1 (14.28)
(b) <i>Goal-planning</i> + <i>Hybrid</i>	1 (9.09)	1 (14.28)	1 (9.09)	1 (14.28)
Double Pure Type-Hybrid Switcher	2 (18.18)	0 (0)	2 (18.18)	0 (0)
Inconsistent Type	1 (9.09)	0 (0)	1 (9.09)	0 (0)
Total	8 (100)	7 (100)	11 (100)	7 (100)

Note: ¹Fisher's exact test statistic value is 0.3147. The result is not significant at $p < .05$. ²Fisher's exact test statistic value is 0.1414. The result is not significant at $p < .05$.

Planning Behaviors: Table 3 details the behavioral patterns in planning behaviors for sexual ($n = 11$) and nonsexual ($n = 7$) homicides. Three of the sexual offenders were unclassifiable since they did not contain enough variables in the planning theme in each crime scene and therefore no patterns of change could be identified and used to compare against the nonsexual homicide offender group. Although they may still be considered linked due to other elements of the crime scene, because this aim will only compare the offenders using the subtypes within the MATCH model and no pattern can be detected, they were removed from the comparison. Two sexual homicide offenders contained one crime scene with no theme

given, but still projected a pattern that could be identified given the context of their trajectory. Three (37.5%) sexual offenders remained consistent throughout their entire series (i.e., Consistent Pure or Consistent Hybrid), while the remaining five (62.5%) exhibited patterns of change (i.e., Pure Type Switcher, Pure Type-Hybrid Switcher, Double Pure Type-Hybrid Switcher, Inconsistent). Five (71.4%) nonsexual homicide offenders were consistent throughout their entire series, while the remaining two (28.5%) had patterns of change. Fisher's exact test determined that there is no significant difference between the two groups, $p = .31$.

Wounding Behaviors: Table 3 also details the behavioral patterns in wounding behaviors for sexual ($n = 11$) and nonsexual ($n = 7$) homicides. Four sexual homicide offenders and one nonsexual homicide offender contained one crime scene with no theme given, but still projected a pattern that could be identified given the context of their trajectory. Two (18.18%) sexual offenders remained consistent throughout their entire series, while the remaining nine (81.82%) exhibited patterns of change. Four (57.2%) nonsexual homicide offenders were consistent throughout their entire series, while the remaining three (40.78%) showed patterns of change. Fisher's exact test revealed no significant difference between the two groups, $p = .14$.

Summary

This aim compared serial sexual homicide and serial nonsexual homicide by separately examining their criminal trajectory. The figures shown in the appendix (figures A.1 & A.2) allow us to see the offenders' full series, the themes each crime scene represents, and observe how they present themselves alongside other offenders. There were no statistically significant differences found between the groups' patterns of change in crime scene trajectory. Although there may be differences between the two homicide types in their crime scene actions and the themes that represent those actions (as discussed in aims one and two), both homicide types are similar in their expression of exact consistency throughout their trajectory.

The relationship between serial sexual homicide and violence observed in aims one and two were not apparent in this aim. A possible explanation is that the recurring theme of violence is only apparent

when examining themes and salient crime scene actions, not when observing how those themes and behaviors change throughout the series. On the other hand, the relationship between nonsexual homicides and the psychological construct of familiarity observed in aims one and two was apparent in this aim when examining the offender's crime scene trajectory. Most serial nonsexual homicide offenders were consistent in their subthemes while showing rare occurrences of experimentation.

Conclusion

Similarities Among Sexual and Nonsexual Serial Homicides

This study found some similarities between sexual and nonsexual serial homicides in each of the aims. Firstly, there are crime scene actions that are similarly prevalent in both homicide types (e.g., manual strangulation, $X^2(1, N = 78) = .033, p > .05$; blunt instrument $X^2(1, N = 78) = 0.088, p > .05$; body posed, $X^2(1, N = 78) = 0.069, p > .05$). Additionally, the homicide classification model proposed in Sorochinski and Salfati's (2010) model was applicable to both homicide types when using planning and wounding behavioral themes. Furthermore, the second part of the aim found no significant difference between the two homicide types in regard to planning behaviors, $p = .06$. Finally, the last aim compared the two homicide types by separately examining their crime scene trajectory and found no statistically significant differences between their patterns of change in crime scene trajectory. The results of this aim support that both homicide types are similar in how often they change or remain consistent throughout their trajectory within a series.

Serial Sexual Homicides

This study found several differences between sexual and nonsexual serial homicide samples. These differences pertain to the offenders' crime scene actions, themes of behavior, and psychological constructs evident in their offender behavior. When comparing the two homicide types' salient crime scene features (crime scene features used to link crimes in a serial offense; gathered from Sorochinski & Salfati, 2010), this study found seven crime scene features that were significantly predominant in serial sexual homicides (injuries to victim's face; multiple wounds throughout the victim's body; injuries to the

victim's torso; stabbing; injuries to the victim's pelvic region; binding the victim and wounding the victim after death; $p < .05$). When comparing sexual and nonsexual homicides by their themes of behavior, evident at the crime scene (i.e., planning and wounding themes; as used in Sorochinski & Salfati, 2010), results showed that the two homicide types differed significantly in their wounding behaviors, $p = .05$. Specifically, serial sexual homicide offenders exhibited more process-oriented (mostly nonlethal wounds) and hybrid subthemes (similar amount of lethal and nonlethal wounds) than nonsexual homicides.

The differences found within the serial sexual homicide sample are related to the psychological construct of violence. The significant crime features found predominantly in serial sexual homicides showed that serial sexual homicide offenders often attack their victims in nonvital areas, use several different means to injure their victims, and vary in their methods of killing. Furthermore, the theme of violence was evident in the serial sexual homicide offender's wounding behaviors theme; particularly, they expressed higher levels of process-oriented themes, indicative of causing harm and 'being in the moment' during the murder process (Canter, 2000; Canter and Youngs, 2009). However, the recurring theme of violence was only evident when examining themes and salient crime scene actions, not when observing how those themes and behaviors change throughout the series.

Serial Nonsexual Homicides

The serial nonsexual homicide sample also contained several unique qualities worth mentioning. These differences pertain to the offenders' crime scene actions, themes of behavior, and crime scene trajectory. There was also a psychological construct (familiarity) that was evident in this group's crime scene behaviors. When comparing the two homicide types' salient crime scene features, this study found 11 crime scene features that are more predominant in serial nonsexual homicides (victim's body found inside; found at the murder site; offender spent time at the crime scene after the murder; body found in offender's residence; crime scene was staged; preparatory actions were taken; the victim was family, friend, or a previous intimate partner; victim's body was covered post mortem; the victim was elderly; $p < .05$). Unlike serial sexual homicides, none of the variables that are significantly more present in nonsexual

homicides pertain to wounding behaviors. Furthermore, serial nonsexual homicides contained variables mostly from the planning behaviors theme. When comparing the two homicide types by their behavioral themes, the results showed that serial sexual homicide offenders were significantly different in their wounding behaviors, specifically, serial nonsexual homicide offenders contain more goal-oriented wounding behaviors (mostly lethal wounds) than serial sexual homicides.

The unique qualities found within serial nonsexual homicides are related to the psychological construct of familiarity. The significant crime features predominantly in serial nonsexual homicides showed that they often kill within familiar situations and are not taking risks by murdering in unfamiliar ways. The psychological construct of familiarity was also evident when examining their planning behaviors theme. Specifically, all nonsexual homicide offenders engaged in planning behaviors, which allows for low-risk kills, and have more control of the situation (Canter 2000; Canter & Youngs, 2009). Lastly, the psychological construct of familiarity was observed when examining the offender's crime scene trajectory; specifically, serial nonsexual homicide offenders were consistent in their subthemes, while showing rare occurrences of experimentation.

Discussion

Understanding the differences between sexual and nonsexual serial homicides is essential to facilitate methods used to apprehend these serial offenders (e.g., crime linkage and constructing offender profiles). If the two homicide types are distinct, then examining this group separately may allow for a more in-depth understanding of each serial homicide type. One of the first studies recorded that compared sexual against nonsexual homicides found more similarities than differences between the two groups (Ressler et al., 1988). Regarding topics related to crime linkage via behavioral analysis, studies have identified differences in their crime scene behavior (Harbort et al., 2001) and crime psychology (Myers et al., 2006); however, studies comparing their patterns of thematic change throughout their series are scarce (Salfati, 2019).

Although several studies support differences in behaviors and themes between sexual and nonsexual serial homicides, some literature examines concepts of behavioral consistency and change using a mixed group of sexual and nonsexual serial homicides without seeing how they differ. Thus, the key purpose of this paper was to uncover any behavioral differences between the two homicide types relevant to behavioral consistency and change, then discuss if sexual and nonsexual serial homicides are different enough to examine separately. To explore this, the present study examined the differences between sexual and nonsexual serial homicide by (a) comparing their salient crime scene features and thematic patterns; (b) applying the homicide classification model constructed in Sorochinski and Salfati (2010); and (c) comparing their trajectory patterns (using MATCH; Salfati & Sorochinski, 2019).

Key Takeaways From the Analysis of Salient Crime Scene Features & Thematic Differences

The comparison between sexual and nonsexual serial homicide offenders' crime scene actions revealed differences in their crime scene features. For serial sexual homicide offenders, the differences found in this sample pertained to their wounding behaviors. Specifically, they were more violent than serial nonsexual homicide offenders. Similar to the findings of Carter et al. (2017) and a study using samples from Germany by Harbort and Mokros (2001), the victims of sexual homicides endured several violent injuries and were bound more often. This study also supports the findings of Myers et al. (2006), who concluded that serial sexual homicide offenders commit their crimes in a violent manner. However, this study did not find a significant relationship between serial sexual homicide and homicide by strangulation, which is counter to what Skott et al. (2021) found. A possible reason for this is that death by strangulation is not the only violent method of killing serial sexual homicide offenders choose to take; instead, they may choose to stab or use a combination of methods. A comparison between their combination of methods used to kill their victims can allow for a deeper understanding of which homicide type is more diverse and multifaceted in their killing methods. The connection between this study's findings and the findings of previous studies suggests that there are some similarities among serial homicide offenders from Germany; which further supports McKinley and Petherick's (2021) paper that

discusses the similarities in crime scene characteristics (e.g., method of killing, victim body location, victim gender) among serial homicide offenders across samples from different countries.

Salfati and Taylor's (2006) study argues that the sexual component of an offense should be viewed as a variable of aggression, thus sexual and nonsexual offenders can be examined within the same classification system, which this study supports. When comparing the sexual crime scene behaviors (listed in table 1) from the sexual homicide group to the nonsexual homicide group, there were only three significant results (vaginal penetration, victim redressed post mortem, and anal penetration), suggesting that the difference may be less about the sexual elements (as discussed in Bateman & Salfati, 2007; Salfati & Taylor, 2006), and possibly more about themes expressed in their offenses.

In comparison to the serial sexual homicide offenders, the serial nonsexual homicide offenders mostly killed people they knew, planned for the crime, and took precautions to avoid getting caught. The results add to Harbort and Mokros' (2001) study which found that serial nonsexual homicide offenders typically killed their victims using a weapon and did not have physical contact with the victim, as well as Skott et al.'s (2021) and Carter et al.'s (2017) study which found nonsexual homicide offenders kill people they knew. Regarding their trajectory patterns, the serial nonsexual homicide sample was consistent in their planning and wounding behavioral themes and showed rare occurrences of experimentation. Most of the findings pertaining to nonsexual serial homicides in this study are already established in other studies, however, this paper consolidates those findings and expands on them by incorporating the examination of their trajectory patterns.

Key Takeaways From the Utilization of Sorochinski and Salfati's (2010) Classification Model

The comparison between sexual and nonsexual serial homicide offenders' behavioral themes were made using the themes constructed in Sorochinski and Salfati's (2010) homicide classification model. The model features three distinct themes (i.e., planning, wounding, and a reinterpretation of victim-offender interaction) based on Canter's (2000) work focusing on serial sexual assault. After testing if the themes used in their model were applicable to this study's sample, it was discovered that the

planning and wounding behavioral themes were supported, but the reinterpretation of the victim-offender interaction theme was not. Although Sorochinski and Salfati (2010) modified this theme to apply it to serial homicide, the crime scene actions for serial assault and serial homicide may differ in how useful they are for linking serial offenses. A possible reason the reinterpreted victim-offender interaction theme was not applicable to this study's sample is that this theme contained variables that belonged to a third subtheme (victim as person; Canter, 2000) which was removed. Though the theme was removed, the variables that made up the theme remained in the model and were reinterpreted to the other subthemes based on how they co-occur with other variables. This method can cause two problems: Firstly, it may affect the model's accuracy in detecting themes of behavior, since variables that better represent the theme that was removed are now representing a different theme. Secondly, it creates multiple variants of the same theme, some with variables that exist in other themes. This disconnect may misguide practitioners who wish to utilize these models and cause conflict in the research which aims to understand the psychology of the offenders. Although difficult, it may be worth trying to eliminate variables from themes that may subjectively fall into other subthemes, in order to obtain a unanimously accepted theme with a specific set of variables.

Key Takeaways From the Utilization of MATCH (Salfati and Sorochinski, 2019)

In addition to comparing specific behaviors and behavioral themes between sexual and nonsexual serial homicides, this study also compared the two groups' degrees of behavioral change. The comparison of their behavioral change was included because this concept is important for the process of linking crimes (Salfati, 2019). For instance, when an offender is not exactly consistent in their behaviors, it may be difficult to link their crimes. Thus, knowing which offender type is more or less consistent in their crime scene behaviors is a helpful piece of information for designing and implementing models that examine behavioral change.

The present study utilized the Model for the Analysis of Trajectories and Consistency in Homicide (MATCH) (Salfati & Sorochinski, 2019) to understand how sexual and nonsexual serial

homicide offenders change or remain consistent in their themes of behavior throughout their series (i.e., trajectory patterns). Because the results show that the two homicide types are similar in their trajectory patterns, future research should investigate if methods that look at trajectory patterns are equally effective across both homicide types. This finding, however, was not consistent with previous studies which found that serial sexual homicide offenders exhibited minimal consistency in their crime scene behaviors throughout their series, compared to nonsexual homicide offenders (Harbort & Mokros, 2001; McKinley & Petherick, 2021). A likely reason for this difference is that this study aimed to compare exact consistency and patterns of change, but did not account for the degree of variability within each trajectory type in the MATCH model. For example, the “Double Pure Hybrid Switcher” and the “Inconsistent” type both have a higher amount of crime scene theme variability compared to the “Double Pure” type; however, they were put into the same category labeled “patterns of change” for the comparison. If the variation between MATCH trajectory types were accounted for, then it would have allowed for a better understanding of how consistent or dynamic each homicide type is in their themes of behavior. It is important to note that this comparison was made using varied crime scene lengths (three to five). For every additional crime scene, there is an opportunity for variability (Chopin et al., 2020; Davies, 1991; Edelstein, 2016; Keppel, 2000), so by comparing offenders with different crime scene lengths, it is more likely that offenders with longer series will be less consistent than offenders with shorter series - which in turn impacts the validity of the study. To better understand the findings of this aim, future studies should compare offenders with identical series lengths.

According to Woodhams and Bennell, (2014) if the majority of offenders fall into the same subset of behaviors, then that subset of behaviors may not be unique enough to be salient, and thus, may not be reliably used to link crimes. Furthermore, Canter (2004) emphasizes that a lack of individual differentiation is likely due to using a thematic distinction that is too common within the type of homicide. Considering the majority of sexual homicide crime scenes were pre-planned themed (as can be seen in figure A.1), this raises questions regarding how useful the planning theme is for linking serial sexual homicides. A possible reason all serial sexual series contained a pre-planned theme is that this

theme may require additional subdivisions that can differentiate types of pre-planning behaviors (for example, impulsive or tactful) among serial sexual homicide offenders. To this point, 17 sexual homicides did not contain enough variables to classify a planning subtheme, which could mean the crime was not planned- this is an avenue future research could explore. Although all of the serial sexual homicides contained a pre-planned subtheme, the patterns in which they expressed it along with other subthemes were all different (based on the MATCH typologies). In the case of this sample set, the planning behavior theme may not be useful for crime linkage analysis without the utilization of MATCH. The results exemplify the unique effectiveness of the MATCH system for both homicide types since it accommodates offense types that are consistent or dynamic.

Limitations

There are several limitations throughout this study worth addressing. Starting with the study data, because serial homicides are a rare occurrence, obtaining a sample of crime scene behaviors from strictly sexual and nonsexual serial homicides was especially limiting. Despite the rare occurrences, this study gathered a sample of 18 serial offenders, comprising 78 crime scenes, and contained findings aligned with previous literature. It is important to note that the small sample size may not be inclusive enough to extrapolate reliably from, and the results could be an artifact of the cases and not actually the crime types. The *N* is too small to generalize but may serve to highlight trends and compare the findings to the literature focusing on strictly sexual or nonsexual homicide. Additionally, this study was based on Sorochinski and Salfati's (2010) study, which used samples from an older version of the data set. Although the sample group is not exactly the same, there can be some overlap in sample selection. The variables collected for this study were gathered from archived police crime files that were not intended to be used in research and consisted of case facts intended to be used for the prosecution of the offender.

The results of this study are also not applicable to serial homicide in general because this study strictly looked at sexual and nonsexual serial homicide. If this study had compared sexual, nonsexual, and mixed serial offenders' trajectory patterns and themes, then this could have allowed one to understand

whether or not the third offender group, mixed serial offenders, could be examined within the same framework as sexual or nonsexual serial homicide offenders. The mixed serial offender sub-group was ultimately not incorporated into the study because this study aimed to consolidate and expand upon the literature discussing the differences between strictly sexual and nonsexual serial homicides.

The comparison of behavioral themes (aim 2) was limited in that this study did not follow other studies which classified crime scenes with the occurrence of only one variable. For instance, if a crime scene contained only one variable, then that crime scene was not given a theme based on whichever subtheme the variable represented. The reason for this was to avoid applying a psychological significance to an entire crime scene, based on the presence of one crime scene action.

The comparison of the offender's trajectory patterns (aim 3) compared crime scenes of different lengths which disables a comparison on equal criteria. This was especially limiting since offender themes may change over time (Bateman & Salfati, 2007). Furthermore, using different series lengths may have biased the results by giving too much weight to the offenders with longer series that display increased or decreased behavioral stability over time (Salfati & Bateman, 2005). Furthermore, the varied series length could have impacted the results of the comparison of crime scene actions and themes because as an offender commits repeated homicides, they may change their behavior. Therefore, this study may have unintentionally compared the offenders' behavioral themes with varying amounts of expertise in homicide. However, as discussed in the methods section, the average length and standard deviation of the series in this study's sample are close across both homicide types, showing that both homicide types have similar proportions of three, four, and five-length crime scenes.

Directions for Future Studies

To further expand upon our understanding of the differences between sexual and nonsexual serial homicides, future research should investigate if their differences can be used as indicators of sexual motivation. Creating a model which differentiates crime scenes' sexual motivation based on objective behavioral evidence can be a useful tool since, in some cases, officers and researchers may misclassify a

serial sexual homicide as a serial nonsexual homicide (or mix) due to some crime scenes not showing any objective indicators of sexual assault. Furthermore, not having access to this information can affect the psychological profile constructed for the offender (Canter, 2011) and limit the potential data acquired when investigating a sexual homicide.

Final Key Takeaways

This study concludes that although sexual and nonsexual serial homicides can be analyzed within the same classification system, examining them separately allows for an understanding of how the themes are projected differently in each homicide type. The findings of this study are in support of the findings of previous studies, which have suggested that serial sexual and nonsexual homicides are different enough to examine separately due to their differences in their crime scene actions and themes of behaviors (e.g., Chan & Heide, 2016; Chopin & Beauregard, 2019; Skott et al., 2021). Other studies suggest these differences are less about the sexual element of the homicides (Salfati & Taylor, 2006) and more about how the psychological constructs of violence and familiarity are projected throughout their crime scene behaviors and behavioral patterns (Chan & Heide, 2016; Chopin & Beauregard, 2019; Harbort et al., 2001, Myers et al., 2006; Skott et al., 2021), which this study corroborates. For example, in this study, the psychological concept of violence was portrayed through the serial sexual homicide offender's significant amount of nonlethal wounding. Whereas the serial nonsexual homicide offender sample portrayed the psychological concept of familiarity by, for example, murdering people they know, preparing for the crime, and taking low-risk actions. The differences found in this study and other studies support the practice of looking at the two homicide types separately; specifically when examining concepts related to crime scene violence and the offender's familiarity with the crime. By examining the two homicide types together, concepts that differentiate the two may not be discovered, which otherwise would have led to a better understanding of the psychology of each homicide type. Due to the paper's limitations, the findings of this study warrant further investigation of the differences between sexual and nonsexual serial homicide offenders, and the methods selected to understand their behavioral consistency and change.

References

- Bateman, A. L., & Salfati, C. G. (2007). An examination of behavioral consistency using individual behaviors or groups of behaviors in serial homicide. *Behavioral Sciences & the Law, 25*(4), 527–544. <https://doi-org.ez.lib.jjay.cuny.edu/10.1002/bsl.742>
- Beauregard, E., Rossmo, K., & Proulx, J. (2007). A descriptive model of the hunting process of serial sex offenders: A rational choice perspective. *Journal of Family Violence, 22*, 449-463. <https://doi.org/10.1007/s10896-007-9101-3>
- Beauregard, E., Lussier, P., & Proulx, J. (2008). Criminal propensity and crime opportunity: An investigation of crime scene behaviors of sexual aggressors of women. In R.N. Kocsis (Ed.), *Criminal profiling: International theory, research, and practice* (pp. 89-113). Humana Press.
- Burgess, A. W., Hartman, C. R., Ressler, R. K., Douglas, J. E., & McCormack, A. (1986). Sexual homicide: A motivational model. *Journal of Interpersonal Violence, 1*, 251-272. <https://doi.org/10.1177/088626086001003001>
- Canter, D. V. (2000). Offender profiling and criminal differentiation. *Legal and Criminological Psychology, 5*(1), 23–46. <https://doi.org/10.1348/135532500167958>.
- Canter, D. V. (2004). Offender profiling and investigative psychology. *Journal of Investigative Psychology and Offender Profiling, 1*(1), 1-15. <https://doi.org/10.1002/jip.7>
- Canter, D. V. (2011). Resolving the offender “profiling equations” and the emergence of an investigative psychology. *Current Directions in Psychological Science, 20*(1), 5-10. <https://doi-org.ez.lib.jjay.cuny.edu/10.1177/0963721410396825>
- Canter, D. V., Benell, C., Alison, L. J., & Reddy, S. (2003). Differentiating sex offences: A behaviorally based thematic classification of stranger rapes. *Behavioral Sciences & the Law, 21*(2), 157–174. <https://doi-org.ez.lib.jjay.cuny.edu/10.1002/bsl.526>
- Canter, D., & Youngs, D. (2009). *Investigative psychology: Offender profiling and the analysis of criminal action*. John Wiley & Sons Ltd.

- Carter, A. J., Hollin, C. R., Stefanska, E. B., Higgs, T., & Bloomfield, S. (2017). The use of crime scene and demographic information in the identification of non-serial sexual homicide. *International Journal of Offender Therapy and Comparative Criminology*, *61*(14), 1554–1569.
<https://doi-org.ez.lib.jjay.cuny.edu/10.1177/0306624X16630313>
- Chan, H. C. O., & Heide, K. M. (2016). Sexual homicide offenders distinguished from non-homicidal sexual offenders: A review of the literature. *Aggression and Violent Behavior*, *31*, 147-156.
<https://doi.org/10.1016/j.avb.2016.09.002>
- Chopin, J., & Beauregard, E. (2019). The sexual murderer is a distinct type of offender. *International Journal of Offender Therapy & Comparative Criminology*, *63*(9), 1597–1620.
<https://doi-org.ez.lib.jjay.cuny.edu/10.1177/0306624X18817445>
- Chopin, J., Beauregard, E., & Bitzer, S. (2020). Factors influencing the use of forensic awareness strategies in sexual homicide. *Journal of Criminal Justice*, *71*, 1-9.
<https://doi-org.ez.lib.jjay.cuny.edu/10.1016/j.jcrimjus.2020.101709>
- Davies, A., Wittebrood, K., & Jackson, J. (1991). Predicting the criminal antecedents of a stranger rapist from his offence behavior. *Science & Justice*, *37*, 161-170.
[https://doi.org/10.1016/S1355-0306\(97\)72169-5](https://doi.org/10.1016/S1355-0306(97)72169-5)
- Edelstein, A. (2016). Rethinking conceptual definitions of the criminal career and serial criminality. *Trauma, Violence & Abuse*, *17*(1), 62–71.
<https://doi-org.ez.lib.jjay.cuny.edu/10.1177/1524838014566694>
- Harbers, E., Deslauriers-Varin, N., Beauregard, E., & van der Kemp, J. J. (2012). Testing the behavioural and environmental consistency of serial sex offenders: A signature approach. *Journal of Investigative Psychology and Offender Profiling*, *9*, 259–273. <https://doi.org/10.1002/jip.1368>
- Higgs, T., Carter, A. J., Stefanska, E. B., & Glorney, E. (2017). Toward identification of the sexual killer: A comparison of sexual killers engaging in post-mortem sexual interference and non-homicide sexual aggressors. *Sexual Abuse*, *29*(5), 479–499. <https://doi.org/10.1177/1079063215609935>

- Keppel, R. D. (2000). Investigation of the serial offender: Linking cases through modus operandi and signature. In L.B. Schlesinger (Ed.), *Serial offenders: Current thoughts, recent findings* (pp.121–133). Routledge.
- Labuschagne, G. N. (2014). The use of linkage analysis evidence in serial offense trials. In J. Woodhams, & C. Bennell (Eds.), *Crime Linkage: Theory, research, and practice* (pp. 197–224). Routledge.
- Langevin, R., Ben-Aron, M., Wright, P., Marchese, V., & Handy, L. (1988). The sex killer. *Annals of Sex Research, 1*, 263-301. <https://doi.org/10.1007/BF00852801>
- McKinley, A., & Petherick, W. (2021). Serial homicide in Australia, 1820-2020. *Salus Journal, 9*(2), 39–50.
- Myers, W.C., Husted, D.S., Safarik, M.E., & O'Toole, M.E. (2006). The motivation behind serial sexual homicide: is it sex, power, and control, or anger? *Journal of Forensic Sciences, 51*, 900-907. <https://doi.org/10.1111/j.1556-4029.2006.00168.x>
- Ressler, R.K., Burgess, A.W., & Douglas, J. (1988). *Sexual homicide: Patterns and motives*. The Free Press.
- Salfati, C. G. (2008). Offender profiling: Psychological and methodological issues of testing for behavioural consistency. In *Issues in Forensic Psychology: Investigative Psychology. (Vol.8)* (pp.68-81). British Psychological Society, Division of Forensic Psychology Publications.
- Salfati, C. G. (2010) *The Homicide Profiling Index – Revised to include Rape and Sexual Offenses* (HPI-R©). Coding Dictionary. Investigative Psychology Research Unit, John Jay College of Criminal Justice, New York, NY.
- Salfati, C. G. (2015). Homicide & Rape Database. Unpublished raw data, Investigative Psychology Research Unit, John Jay College of Criminal Justice, New York, NY.
- Salfati, C. G. (2019). Consistency of offender behaviors and victim targeting in serial sexual violence: An overview of the field. In W.T. O'Donohue & P.A. Schewe (Eds.), *Handbook of sexual assault and sexual assault prevention* (Chapter 47).Springer.

- Salfati, C. G., & Bateman, A. L. (2005). Serial homicide: An investigation of behavioural consistency. *Journal of Investigative Psychology and Offender Profiling, 2*, 121–144.
<https://doi.org/10.1002/jip.27>
- Salfati, C. G., James, A. R., and Ferguson, L. (2008). Prostitution homicides: A descriptive study. *Journal of Interpersonal Violence, 23*(4) 505-543. <https://doi.org/10.1177/0886260507312946>.
- Salfati, C. G., & Sorochinski, M. (2019). MATCH: A new approach for differentiating & linking series of sex worker homicides and sexual assaults. *International Journal of Offender Therapy and Comparative Criminology, 63*(9), 1794-1824. <https://doi.org/10.1177/0306624X19839279>
- Salfati, C. G., & Taylor, P. (2006). Differentiating sexual violence: A comparison of sexual homicide and rape. *Psychology, Crime, and Law, 12*(2), 107-126. <https://doi.org/10.1080/10683160500036871>.
- Salo, B., Sirén, J., Corander, J., Zappalà, A., Bosco, D., Mokros, A., & Santtila, P. (2013). Using Bayes' theorem in behavioural crime linking of serial homicide. *Legal & Criminological Psychology, 18*(2), 356–370. <https://doi-org.ez.lib.jjay.cuny.edu/10.1111/j.2044-8333.2011.02043.x>
- Santtila, P., Pakkanen, T., Zappala, A., Bosco, D., Valkama, M., & Mokros, A. (2008). Behavioural crime linking in serial homicide. *Psychology, Crime & Law, 14*, 245–265.
<https://doi.org/10.1080/10683160701739679>
- Schlesinger, L.B. (2007). Sexual homicide: Differentiating catathymic and compulsive murders. *Aggression and Violent Behavior, 12*, 242–56. <https://doi.org/10.1016/j.avb.2006.09.007>
- Sewall, L.A., Krupp, D.B., & Lalumiere, M.L. (2013). A test of two typologies of sexual homicide. *Sexual Abuse: A Journal of Research and Treatment, 25*(1), 82–100.
<https://doi.org/10.1177/1079063212452617>
- Shye, S., Elizur, D., & Hoffman, M. (1994). *Introduction to facet theory: Content design and intrinsic data analysis in behavioral research*. Sage Publications.
- Smith, S. G., Basile, K. C., & Karch, D. (2011). Sexual homicide and sexual violence-associated homicide: Findings from the national violent death reporting system. *Homicide Studies, 15*(2), 132–153.
<https://doi.org/10.1177/1088767911406236>

- Sorochinski, M., & Salfati, C. G. (2010). The consistency of inconsistency in serial homicide: Patterns of behavioral change across series. *Journal of Investigative Psychology and Offender Profiling*, 7, 109-136. <https://doi.org/10.1002/jip.118>.
- Sorochinski, M., & Salfati, C. G. (2017). Assumptions underlying behavioral linkage revisited: A revised approach to ascertaining individual differentiation and consistency in serial rape. In: P. A. Granhag, R. Bull, A. Shaboltas, & E. Dozortseva (Eds.). *Psychology & Law in Europe: When West Meets East* (pp. 51-78). Routledge.
- Sorochinski, M., & Salfati, C. G. (2018). A multidimensional approach to ascertaining individual differentiation and consistency in serial sexual assault: Is it time to redefine and refine? *Journal of Police and Criminal Psychology*, 33(1), 63–83. <https://doi-org.ez.lib.jjay.cuny.edu/10.1007/s11896-017-9235-z>
- Skott, S., Beauregard, E., & Darjee, R. (2021). Sexual and nonsexual homicide in Scotland: Is there a difference? *Journal of Interpersonal Violence*, 36(7/8), 3209–3230. <https://doi-org.ez.lib.jjay.cuny.edu/10.1177/0886260518774303>
- Tonkin, M., Pakkanen, T., Sirén, J., Bennell, C., Woodhams, J., Burrell, A., Imre, H., Winter, J. M., Lam, E., ten Brinke, G., Webb, M., Labuschagne, G. N., Ashmore-Hills, L., van der Kemp, J. J., Lipponen, S., Rainbow, L., Salfati, C. G., & Santtila, P. (2017). Using offender crime scene behavior to link stranger sexual assaults: A comparison of three statistical approaches. *Journal of Criminal Justice*, 50, 19–28. <https://doi-org.ez.lib.jjay.cuny.edu/10.1016/j.jcrimjus.2017.04.002>
- Trojan, C., & Salfati, C. G. (2009). Methodological considerations of determining dominance in multidimensional analyses of crime scene behaviours and offender characteristics. *Journal of Investigative Psychology & Offender Profiling*, 5(3), 125–145. <https://doi-org.ez.lib.jjay.cuny.edu/10.1002/jip.88>
- Trojan, C., & Salfati, C. G. (2011). Linking criminal history to crime scene behavior in single-victim and serial homicide: Implications for offender profiling research. *Homicide Studies*, 15(1), 3–31. <https://doi.org/10.1177/1088767910397281>

U.S. Department of Justice, Federal Bureau of Investigation (2008). *Serial murder multi-disciplinary perspectives for investigators*.

<https://www.fbi.gov/file-repository/stats-services-publications-serial-murder-serial-murder-july-2008-pdf>

U.S. Department of Justice, Federal Bureau of Investigation. (2011). *Crime in the United States*.

https://ucr.fbi.gov/crime-in-the-u.s/2011/crime-in-the-u.s.-2011/violent-crime/violentcrimemain_final.pdf

U.S. Department of Justice, Federal Bureau of Investigation (2020). *FBI releases 2019 crime statistics*.

<https://ucr.fbi.gov/crime-in-the-u.s/2019/crime-in-the-u.s.-2019/topic-pages/murder>

Woodhams, J., & Bennell, C. (Eds.) (2014). *Crime linkage: Theory, research, and practice*. Routledge.

<https://doi.org/10.1201/b17591>

Woodhams, J., & Labuschagne, G. (2012). A test of case linkage principles with solved and unsolved serial rapes. *Journal of Police and Criminal Psychology, 27*, 85–98.

<https://doi.org/10.1007/s11896-011-9091-1>

Woodhams, J., Tonkin, M., Burrell, A., Imre, H., Winter, J. M., Lam, E. K. M., ten Brinke, G. J., Webb,

M., Labuschagne, G., Bennell, C., Ashmore, H. L., van der Kemp, J., Lipponen, S., Pakkanen, T.,

Rainbow, L., Salfati, C. G., & Santtila, P. (2019). Linking serial sexual offenses: Moving towards an ecologically valid test of the principles of crime linkage. *Legal and Criminological Psychology, 24*(1), 123–140.

<https://doi-org.ez.lib.jjay.cuny.edu/10.1111/lcrp.12144>

Appendix

Visual Representation of Serial Offenders' Crime Scene Theme and MATCH Typology

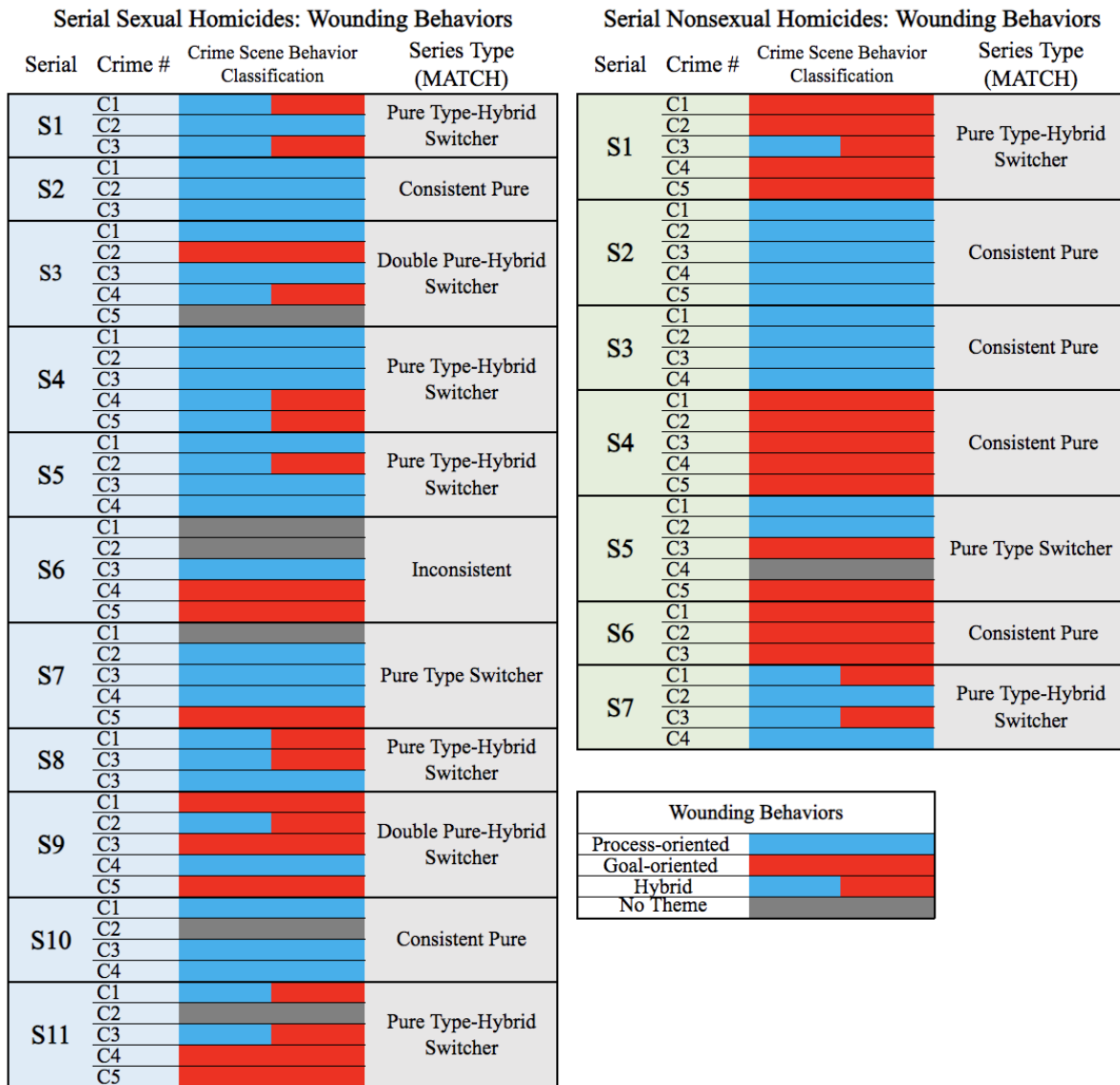
Figure A.1. Linking Serial Offenders and Applying the Series Type Based on Planning Behaviors

Serial Sexual Homicides: Planning Behaviors				Serial Nonsexual Homicides: Planning Behaviors			
Serial	Crime #	Crime Scene Behavior Classification	Series Type (MATCH)	Serial	Crime #	Crime Scene Behavior Classification	Series Type (MATCH)
S1	C1	Pre-planning	Pure Type-Hybrid Switcher	S1	C1	Pre-planning	Consistent Pure
	C2	Post-planning			C2	Pre-planning	
	C3	Hybrid			C3	Pre-planning	
S2	C1	Pre-planning	C4		Pre-planning		
	C2	Post-planning	C5		Pre-planning		
	C3	Hybrid	C1	Pre-planning			
S3	C1	Pre-planning	Consistent Pure	S2	C2	Post-planning	Pure Type-Hybrid Switcher
	C2	Post-planning			C3	Pre-planning	
	C3	Hybrid			C4	Pre-planning	
	C4	Hybrid			C5	Pre-planning	
	C5	No Theme			C1	Pre-planning	
S4	C1	Pre-planning	Consistent Pure	S3	C2	Pre-planning	Consistent Pure
	C2	Pre-planning			C3	Pre-planning	
	C3	Pre-planning			C4	Pre-planning	
	C4	Pre-planning			C1	Pre-planning	
	C5	Pre-planning			C2	Post-planning	
S5	C1	Pre-planning	Consistent Pure	S4	C3	Post-planning	Consistent Hybrid
	C2	Post-planning			C4	Post-planning	
	C3	Hybrid			C5	Post-planning	
	C4	Hybrid			C1	Post-planning	
S6	C1	Pre-planning	Pure Type-Hybrid Switcher	S5	C2	Post-planning	Consistent Pure
	C2	Post-planning			C3	Post-planning	
	C3	Hybrid			C4	Post-planning	
	C4	Hybrid			C5	Post-planning	
	C5	No Theme			C1	Post-planning	
S7	C1	Pre-planning	Unclassifiable	S6	C2	Hybrid	Consistent Hybrid
	C2	Post-planning			C3	Hybrid	
	C3	Hybrid			C1	Pre-planning	
	C4	Hybrid			C2	Pre-planning	
	C5	Hybrid			C3	Pre-planning	
S8	C1	Pre-planning	Unclassifiable	S7	C4	Post-planning	Double Pure-Hybrid Switcher
	C2	Post-planning			C1	Pre-planning	
	C3	Hybrid			C2	Post-planning	
	C3	Hybrid			C3	Post-planning	
	S9	C1		Pre-planning	Inconsistent	S8	C4
C2		Post-planning	C1	Post-planning			
C3		Hybrid	C2	Post-planning			
C4		Hybrid	C3	Post-planning			
C5		No Theme	C4	Post-planning			
S10	C1	Pre-planning	Inconsistent	S9	C1	Pre-planning	Unclassifiable
	C2	Post-planning			C2	Pre-planning	
	C3	Hybrid			C3	Pre-planning	
	C4	Hybrid			C4	Pre-planning	
	C5	No Theme			C5	Pre-planning	
S11	C1	Pre-planning	Unclassifiable	S10	C1	Pre-planning	Unclassifiable
	C2	Post-planning			C2	Pre-planning	
	C3	Hybrid			C3	Pre-planning	
	C4	Hybrid			C4	Pre-planning	
	C5	No Theme			C5	Pre-planning	

Planning Behaviors	
Pre-planning	Pre-planning
Post-planning	Post-planning
Hybrid	Hybrid
No Theme	No Theme

Note. No theme represents crime scenes that contained less than two variables.

Figure A.2. Linking Serial Offenders and Applying the Series Type Based on Wounding Behaviors



Note. No theme represents crime scenes that contained less than two variables.