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Examining the Relationship Between Criminal Careers and Criminal Expertise in Serial and Single Homicide Offenders

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Single Homicide Offenders

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Abstract

The literature suggests that offenders with prior criminal experience are likely to exhibit criminal expertise in future crimes to avoid detection, including planning behaviors and forensic awareness strategies. Many studies have found that the majority of serial and single homicide offenders already have criminal records before they commit their first homicides, yet no studies to-date have explicitly analyzed the relationship between their criminal careers and their use of criminal expertise. Therefore, the current study aimed to examine the relationship between 27 serial and 191 single homicide offenders' criminal careers and the criminal expertise employed in their first homicides to differentiate homicide offenders with varying criminal career backgrounds and ultimately aid offender profiling efforts. First, the study established serial and single homicide offenders' criminal career specializations using the expressive and instrumental framework, and subsequently differentiated them by their dominant criminal career groups (*expressive specialist/ instrumental specialist/ generalist/ no criminal history*). Next, the study sought to differentiate their criminal expertise actions by instrumental subgroups of control (*control over the victim/ the outcome*). Lastly, the study linked serial and single homicide offenders' dominant criminal career groups to their dominant criminal expertise action groups. Multidimensional analyses followed by chi-square tests indicated that serial and single homicide offenders' use of criminal expertise was the same across criminal career backgrounds, with the exception of single homicide offenders expressive specialists who were more likely to control the outcome of their first homicide. Implications of the results and future objectives for additional research are discussed.

Keywords: Homicide, criminal career, criminal expertise, planning, forensic awareness

Examining the Relationship Between Criminal Careers and Criminal Expertise in Serial

and Single Homicide Offenders

Literature Review

Investigative psychology based offender profiling is an empirically-based practice utilized to help investigators link offenders' observable crime scene actions to their most likely characteristics, and by doing so, narrow down the potential suspect pool in criminal investigations (Canter, 2000; Salfati, 2008b). The A$\rightarrow$C equation characterizes this process, where the arrow ($\rightarrow$) represents inferences based on empirically established relationships between offenders' crime scene (A)ctions and (C)haracteristics (Canter, 2000; Canter, 2004).

Through a process referred to as individual differentiation, Canter (2004) noted that it is critical to differentiate offenders' crime scene actions first, by identifying crime scene subtypes to develop empirically-based inferences that improve the efficacy of the profiling equation. Salfati (2008a) argued that using a thematic approach to examine individual differentiation is more effective than comparing individual crime scene actions. Using a thematic approach involves establishing themes of co-occurring behaviors, providing an empirical foundation for classifying offenders' crime scene actions into subtypes based on similar psychological meanings, while controlling for situational factors that could influence the use of individual behaviors (Canter & Heritage, 1990; Salfati & Canter, 1999).

Furthermore, Canter (2000) stated that using a thematic approach provides greater empirical support for inferring offenders' most likely characteristics from their crime scene actions. This assertion is built on a key psychological premise in offender profiling research which suggests that there is a thematic behavioral consistency between offenders' crime scene behaviors and who they are across other aspects of their lives (e.g. their criminal career) (Salfati, 2000;

Salfati, 2008b). Testing this hypothesis, Salfati and Canter (1999) and Salfati (2000) found that offenders' characteristics could also be classified into themes by examining the co-occurrence of psychologically similar background variables, and therefore could be thematically linked with their crime scene actions.

Investigative psychologists have examined the A→C equation in serial and single homicide offenders to provide an empirical basis for narrowing down the suspect pool in homicide investigations. The current study defines a single homicide offender as an individual who has committed one homicide prior to conviction and a serial homicide offender as an individual who has committed at least two homicides in two separate events prior to conviction (Federal Bureau of Investigation [FBI], 2008; Pakkenen et al., 2015; Sturup, 2018). Differentiating serial and single homicide offenders can positively impact the practice of offender profiling. If there are in fact significant distinctions, investigators can identify the specific resources and procedures needed to narrow down the suspect pool to the most likely offender (Kraemer et al., 2004; Salfati & Bateman, 2005). For example, investigators can utilize databases such as the FBI's Violent Criminal Apprehension Program (ViCAP) to identify and predict homicide linkages in cases where a homicide is most likely committed by a serial homicide offender (Pakkanen, et al., 2015). However, if serial and single homicide offenders tend to exhibit predominantly similar behaviors, investigators can instead apply uniform procedures to identify common homicide behavioral patterns to help detect the suspect (Salfati & Bateman, 2005).

The literature suggests that there is a relationship between offenders with prior criminal experience and use of criminal expertise in future crimes (Beauregard & Martineau, 2014; Chopin et al., 2020; Edelstein, 2016; Park, 2008). However, no studies have examined this relationship in serial and single homicide offenders although they are both likely to be criminally involved before

committing their first homicide (Beauregard & Martineau, 2013; 2014; DeLisi & Scherer, 2006; Harbort & Mokros, 2001; Sturup, 2018). Therefore, the current study sought to examine the thematic relationship between serial and single homicide offenders' criminal careers (C) and the criminal expertise actions (A) employed in their first homicides. Through identifying significant behavioral differences among homicide offenders, the current study aimed to determine whether a homicide could be identified as a single offense or part of a series, which in turn, would help to narrow down the suspect pool in homicide investigations.

Offender Characteristics: Criminal Career (C)

It is essential to determine salient variables for analysis to effectively differentiate serial and single homicide offenders. Doing so forms the basis for empirically sound inferences of offenders' most likely characteristics from their observable crime scene actions. Furthermore, in order to discern differences among serial and single homicide offenders that are useful for profiling, the crime scene actions and characteristics studied should not be common to all homicide offenders, nor should they be unique to only a small group of homicide offenders (Salfati & Sorochinski, 2021). Numerous studies have found that the majority of serial and single homicide offenders already have criminal records before committing their first homicides (Beauregard & Martineau, 2013; 2014; DeLisi & Scherer, 2006; Harbort & Mokros, 2001; Sturup, 2018). Therefore, differentiating serial and single homicide offenders' criminal careers could be useful for offender profiling, especially because criminal records are readily accessible to law enforcement agencies (Beauregard & Martineau, 2013; 2014). Specifically, some researchers have used a thematic approach to classify offenders' criminal career backgrounds, providing a strong empirical foundation to differentiate serial and single homicide offenders' criminal careers and to

examine thematic links to crime scene action subtypes (Horning et al., 2010; Salfati, 2000; Trojan & Salfati, 2010; Trojan & Salfati, 2016; Youngs et al., 2016).

Youngs et al. (2016) asserted that studying criminal career specialization (e.g. offenders who commit similar offenses across their criminal career) is necessary to advance the scientific basis of offender profiling, because it can help examine the underlying assumption that offenders are consistent across their crimes and support inferences regarding future offenses. Historically, criminal career specialization has been established if offenders' backgrounds consist of the same legally-defined offenses (e.g. only homicide vs. only sexual assault) (Salfati & Taylor, 2006; Trojan & Salfati, 2010; Trojan & Salfati, 2016; Youngs et al., 2016). However, Youngs et al. (2016) suggested that offenders may specialize in clusters of offenses that represent a common goal they wish to attain throughout their criminal career. Youngs et al. (2016) argued that specialization may therefore be best measured by examining the co-occurrence of psychologically similar offenses in offenders' backgrounds. Subsequently, through their research, Youngs et al. (2016) found that criminal career specialization could be established by using a thematic approach, specifically the expressive and instrumental framework, to classify offenders' offense backgrounds into dominant psychological themes.

The Expressive and Instrumental Framework to Classify Criminal Career Specialization

Salfati (2000) established the expressive and instrumental model of aggression to operationalize violent behaviors into two themes of expressive (hostile) aggression and instrumental aggression. Expressive aggression refers to an offender's primary goal to cause physical harm or death to a victim, and instrumental aggression refers to an offender's primary goal to obtain a benefit such as money or sex through the use of violence.

In order to analyze offender characteristics, it is essential to examine the crime scene as well to establish empirical relationships that aid offender profiling. Thus, Salfati (2000) applied the expressive and instrumental framework to establish a model for classifying homicide behavior, and found that single homicide offenders' crime scenes actions and characteristics could both be differentiated by expressive and instrumental themes. This expressive and instrumental framework has been validated and utilized throughout the literature to classify serial and single homicide offenders' crime scene actions and characteristics into dominant expressive and instrumental themes (Adjorlolo & Chan, 2017; Fox & Allen, 2014; Salfati, 2008a; Salfati & Haratsis, 2001; Salfati & Bateman, 2005; Salfati & Dupont, 2006; Salfati & Park, 2007; Santtila et al., 2001; Trojan & Salfati, 2010).

Trojan and Salfati (2016) and Youngs et al. (2016) used the expressive and instrumental framework based on Salfati (2000) to establish criminal career specialization in single homicide and general offenders respectively. They found that examining the co-occurrences of psychologically similar offenses in offenders' backgrounds resulted in two distinct themes of expressive and instrumental offenses. They theorized that offenses involving direct physical or verbal violence against a person or property represent an individual's primary psychological goal to cause harm and therefore hypothesized that such offenses would co-occur in the expressive theme. Additionally, they hypothesized offenses involving gaining something of value (e.g. money) from another individual (in some cases through the use of violence), would co-occur in the instrumental theme (Trojan & Salfati, 2016; Youngs et al., 2016). Subsequently, Trojan and Salfati (2010) used the expressive and instrumental framework to classify the offenses in both serial and single homicide offenders' criminal histories into the expressive and instrumental themes established by Trojan and Salfati (2016).

The current study aimed to differentiate serial and single homicide offenders' criminal careers. Therefore, it utilized the expressive and instrumental framework as used by Trojan and Salfati (2010) to classify criminal career specialization in serial and single homicide offenders with criminal histories (e.g. expressive specialist, instrumental specialist and generalist). Further, the literature suggests that a minority of convicted homicide offenders do not have criminal histories prior to committing their first homicide (Beauregard & Martineau, 2013; 2014; DeLisi & Scherer, 2006; Harbort & Mokros, 2001; Sturup, 2018. Thus, in order to fully differentiate serial and single homicide offenders' by their varying criminal careers, the current study examined differences in homicide offenders without criminal histories as well.

Table 1 includes a summary of offenses included in the expressive and instrumental themes throughout the literature that may help to differentiate the criminal careers of serial and single homicide offenders. These themes are primarily informed by research by Trojan and Salfati (2010) on classifying criminal career specialization in serial and single homicide offenders, as well as research by Salfati (2000) on single homicide offenders' criminal histories and research by Youngs et al. (2016) on criminal career specialization. Trojan and Salfati (2010) hypothesized that sexual offenses would co-occur in the expressive theme based on prior research on single homicide offenders' criminal histories (e.g. Trojan & Salfati, 2016). However, their results indicated that sexual offenses co-occurred in the instrumental theme when examining serial and single homicide offenders' criminal histories together (Trojan & Salfati, 2010). These results are supported by Salfati, (2000) and Youngs et al. (2016) who found that sexual offenses co-occurred in the instrumental theme in their samples as well, based on the hypothesis that an offender's primary goal in sexual offenses is to obtain something of value from the victim, similar to that of theft and burglary offenses. Additionally, while Trojan and Salfati (2010) included legal offenses in the

instrumental theme and excluded drug, traffic and disorder offenses from either theme, Youngs et al. (2016) included these offenses in the expressive theme (see Table 1).

Table 1

Expressive and Instrumental Criminal Career Variables

Offender Type		Serial and Single Homicide	Single Homicide	General
Expressive		Trojan & Salfati (2010)	Salfati (2000)	Youngs et al. (2016)
	Assault	X	X	X
	Drugs			X
	Traffic			X
	Disorder		X	X
	Domestic Violence	X	X	X
	Harassment	X		X
	Arrest	X		
	Damage	X	X	X
	Legal			X
Instrumental				
	Burglary	X	X	X
	Theft	X	X	X
	Sexual		X	X
	Weapons	X		X
	Robbery	X		X
	Auto-theft	X		X
	Fraud	X	X	X
	Theft-related	X		X

The Crime Scene: Criminal Expertise (A)

The literature suggests that crime scene actions studied should be observable, objective behaviors that ultimately help to elucidate differences in diverse offender backgrounds (Canter, 2004; Salfati, 2000; Salfati & Sorochinski, 2021). Offenders who display criminal expertise in their crime scenes plan out their crimes and use forensic awareness strategies to avoid leaving evidence to ultimately evade law enforcement (Chopin et al., 2020; Davies, 1992; Park et al., 2008). The presence of these behaviors can increase the complexity of the crime scene

environment and hinder the suspect identification process (e.g. targeting sex workers or strangers, moving the victim's body and removing forensic evidence such as the offender's fingerprints) (Beauregard & Martineau, 2013; 2014; Chan & Beauregard, 2019; Chopin et al., 2020; Häkkänen-Nyholm et al., 2009; Pecino-Latorre; 2019; Salfati & Dupont, 2006; Salfati & Haratsis, 2001). Consequently, offender profiling may lend its support in homicide investigations where physical evidence may be missing, yet objective behavioral indicators of criminal expertise are observed.

Studies have examined the quantity and types of individual criminal expertise behaviors present in serial and single homicide offenders' crime scenes. The results showed that serial homicide offenders tend to exhibit higher levels of planning and control, and exercise greater forensic awareness, compared with single homicide offenders who tend to exhibit less criminal expertise, as their behaviors are generally highly impulsive, emotional and anger-driven (Harbort & Mokros, 2001; Kraemer et al., 2004; Pakkanen et al., 2015; Salfati & Bateman, 2005; Sturup 2018; Trojan & Salfati, 2010; Trojan & Salfati, 2011). Nevertheless, research suggests that single homicide offenders are still likely to employ criminal expertise in their homicides by destroying forensic evidence, bringing their own weapon, targeting sex workers and strangers and staging the crime scene (Ferguson, 2019; Pakkenen, et al., 2015; Salfati & Bateman, 2005; Sturup, 2018).

Yet, no studies to-date have used the same thematic framework to explicitly classify serial and single homicide offenders' criminal expertise behaviors employed in their first homicides despite evidence that suggests they both employ criminal expertise. Furthermore, as the literature suggests, serial and single homicide offenders are both likely to have criminal records prior to committing their first homicides (Beauregard & Martineau, 2013; 2014; DeLisi & Scherer, 2006; Harbort & Mokros, 2001; Sturup, 2018). Therefore looking at their first homicides could illuminate significant behavioral differences among serial and single homicide offenders with

different criminal career backgrounds and may provide information needed to determine if the homicide at hand is a single offense or one that is part of a series.

Instrumental Subgroups of Control to Classify Criminal Expertise

Some studies have used the expressive and instrumental framework to classify homicide offenders' salient crime scene actions generally; examining the co-occurrence of criminal expertise behaviors with a variety of other behaviors (Pecino-Latorre et al., 2019; Salfati & Dupont, 2006; Salfati & Haratsis, 2001; Salfati & Park, 2007; Santtila et al., 2001). However, this creates challenges in differentiating serial and single homicide offenders' criminal expertise behaviors explicitly. Furthermore, the current study theorizes that criminal expertise behaviors are best characterized by an instrumental offending style. The expressive offending style is characterized by impulsive, emotional and violent behaviors, which are antithetical to the goal-oriented nature of criminal expertise actions where the offender's ultimate goal is to avoid detection (Horning et al., 2010; Pakkanen et al., 2015; Pecino-Latorre et al., 2019; Trojan & Salfati, 2011).

The literature has identified control as one of the main instrumental crime scene behavioral themes, as well as the primary psychological mechanism underlying the use of criminal expertise (Beauregard & Martineau, 2013; Chopin et al., 2020), in both serial and single homicide offenders' crime scenes (Canter & Heritage, 1990; Horning et al., 2010; Salfati, 2000; Salfati & Canter, 1999; Sorochinski & Salfati, 2010). Studies examining the thematic consistency of behaviors across serial homicide offenders' series have found that the need for control guides their crime scene actions generally, including criminal expertise behaviors (Bateman & Salfati, 2007; Canter et al., 2004; Sorochinski & Salfati, 2010; Sorochinski et al., 2015; Salfati, 2019). Sorochinski and Salfati (2010) classified serial homicide offenders' crime scene actions, including a variety of criminal expertise behaviors into different control-related behavioral subgroups. However, this thematic

framework used by Sorochinski and Salfati (2010) and by subsequent studies such as Sorochinski et al. (2015), was used to analyze behavioral consistency across series specifically. It remains to be tested whether a control-centered thematic framework is relevant to classify single homicide offenders' criminal expertise behaviors.

In a study focusing specifically on single homicide offenses, Horning et al. (2010) examined several criminal expertise variables and found that they could be separated into two distinct subgroups of control: control over the victim and control over the outcome. The control over the victim subgroup included actions employed by an offender to assert power and dominance over their victim to complete their crime in full (e.g. binding, gagging and blindfolding) and the control over the outcome subgroup included actions used by an offender to control the physical crime scene environment (e.g. removing forensic evidence and utilizing preparatory actions such as scouting out the crime scene) (Horning et al., 2010). As the current study aimed to examine the criminal expertise behaviors employed in only the first homicides of serial and single homicide offenders to differentiate them, it utilized the instrumental subgroups of control used in Horning et al. (2010) as the sole thematic framework to do so.

A comprehensive examination of criminal expertise variables has yet to be done in one single study to differentiate serial and single homicide offenders' first homicides. Table 2 includes a summary of salient criminal expertise variables identified in homicide offenders' crimes scenes by Beauregard et al. (2013) and Chopin et al. (2020), also identified within Horning et al.'s (2010) study on single homicide offenders and Sorochinski and Salfati's (2010) study on serial homicide offenders. The variables are separated into control over the victim and control over the outcome subgroups. Table 2 includes additional salient criminal expertise variables such as concealing the victims' body, undressing the victims' body, stalking the victim, and protecting one's identity

identified in Beauregard et al. (2013) and Chopin et al. (2020), that were not examined in Horning

et al. (2010) or Sorochinski and Salfati (2010).

Table 2

Instrumental Subgroups of Control Criminal Expertise Variables

	Beauregard & Martineau (2013)	Chopin et al. (2020)	Horning et al. (2010)	Sorochinski & Salfati (2010)
Control Over the Victim				
Brought own weapon	X			X
Targeted victim	X	X		X
Stalked victim	X			
Undressed victim		X		
Concealed victim's body		X		X
Moved victim's body from crime scene	X	X		X
Bound victim	X	X	X	X
Gagged victim	X		X	X
Control Over the Outcome				
Scouted crime scene			X	X
Protected identity	X	X		
Removed or destroyed forensic evidence	X		X	X
Revisited crime scene	X			X
Dismembered victim's body		X		X
Staged crime scene		X		X

Aims

Figure 1
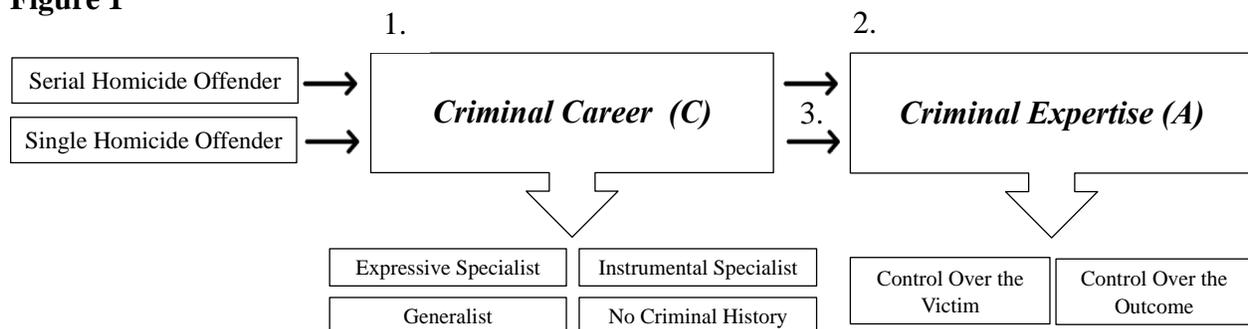
1. First, the study aims to differentiate serial and single homicide offenders' criminal careers.

    Serial and single homicide offenders' criminal careers will be classified into four groups using

the expressive and instrumental framework: 1) expressive specialist, 2) instrumental specialist, 3) generalist, and 4) no prior criminal history (see Figure 1).

2. Next, the study aims to differentiate serial and single homicide offenders' criminal expertise actions used in their first homicides. Serial and single homicide offenders' criminal expertise behaviors will be classified into two groups using the instrumental subgroups of control: 1) control over the victim, and 2) control over the outcome (see Figure 1).

3. Lastly, the study aims to link serial and single homicide offenders' criminal careers groups to their criminal expertise groups to determine if homicide offenders with different criminal career backgrounds employ different criminal expertise behaviors in their first homicides (see Figure 1).

Method

Data Source

The data for this research were taken from closed, fully adjudicated state and local cases that were contributed from law enforcement agencies from around the country for the purpose of research. All identifiers including names of victims, suspects, offenders, officers, departments, correctional agencies, are removed. Only aggregate data are reported on.

The data in the Homicide & Rape Database (Salfati, 2015) are archival and drawn from cases across the country, and were not originally collected for research. As such, case details were not collected in a uniform matter. Further, some data may have been omitted, which does not necessarily indicate their absence (Salfati & Osborne, 2011). The Homicide & Rape Database (Salfati, 2015) is a dataset that was previously put together using the Homicide & Rape Profiling Index Revised coding dictionary (HPI-R©) (Salfati, 2010). The HPI-R consists of 312 coded variables of offender characteristics and crime scene actions, along with other available case file

and victimology information (Salfati, 2010). The majority of variables in the coding dictionary are dichotomous, but also consist of categorical, measurement and descriptor variables. The HPI-R has gone through multiple inter-rater reliability (IRR) tests. Based on the results of these tests, inconsistencies in coding were identified and resolved which helped to develop the final coding dictionary, which received an inter-rater reliability score of 82% – 89% (Salfati, 2005). Therefore, while the data are archival and are not always collected within the same manner, the way in which the data were coded lends reliability and validity to the current study sample.

Only the first homicide from a series and single homicides were included from the Salfati (2015) Homicide & Rape Database in order to determine if differentiating the crime scene could provide information on the most likely type of offender responsible for the homicide (e.g. serial or single homicide offender). Single homicides were selected if the homicide was perpetrated by a single offender against a single victim in a single event, and serial homicides were selected if a single offender perpetrated at two separate homicides against two separate victims (Federal Bureau of Investigation [FBI], 2008; Pakkenen et al., 2015; Sturup, 2018). Cases were excluded where the offender had previous homicide convictions, acted with another offender, or murdered more than one victim in one event. The final dataset used for this study, using the above criteria, was comprised of a total of 218 homicide cases committed by 27 serial homicide offenders and 191 single homicide offenders, selected from the Homicide & Rape Database (Salfati, 2015).

The dates of the 218 homicide cases used in the current study ranged from 1970 to 2008 (Salfati, 2015). Policing, investigative and crime reporting practices have evolved substantially over this time-period, marked by changes in technologies used for forensic analysis of crime scenes (Peterson & Sommers, 2010). It is necessary to note that these changes could potentially affect the types of criminal expertise actions investigated, observed and reported by law enforcement

officials over time. This could influence the specific criminal expertise behaviors identified within homicide offender's crimes scenes in the current sample.

Variables

Offender Characteristics: Criminal Career

The study aimed to differentiate serial and single homicide offenders' criminal careers. Homicide offenders with and without criminal histories were included. Eight serial and 36 single homicide offenders had no criminal histories. 19 serial and 155 single homicide offenders had criminal histories. The current study included variables from Trojan and Salfati (2010), Salfati (2000) and Youngs et al. (2016) as outlined in Table 1, to examine expressive and instrumental criminal career specialization in the homicide offenders with criminal histories. These variables were subsequently selected from the criminal history variables in the HPI-R© (Salfati, 2010). The criminal history variables were coded dichotomously (1 = *present*, 0 = *absent*). Criminal history variables that were not recorded or were unknown were coded as absent.

A frequency analysis was conducted to determine which offenses included in the studies outlined in Table 1 were present in the criminal records of the current sample (see Table 3).Of such offenses, alcohol, armed robbery, vice-sex and dependent offenses occurred in 5% or less of the current samples' backgrounds. These variables were excluded, as low frequency variables have been found to be easily influenced when multiple sample groups are included in the analysis (e.g. both serial and single homicide offenders), and therefore may affect the co-occurrence of offenses in their criminal history backgrounds and cause significant issues with classifying criminal career specialization in the current sample (Trojan & Salfati, 2010). In total, 17 of the original 21 criminal career variables identified in the literature (see Table 1 in literature review) were included for the current study (see Table 3).

The Crime Scene: Criminal Expertise

The study aimed to differentiate serial and single homicide offenders by the criminal expertise used in their first homicide. The current study included the criminal expertise variables examined in Beauregard and Martineau (2013) and Chopin et al. (2020) that were used in Horning et al. (2010) and Sorochinski and Salfati (2010) (see Table 2 in the literature review). These variables were selected from the criminal scene variables in the HPI-R© (Salfati, 2010). Each criminal expertise variable was coded dichotomously (1 = *present*, 0 = *absent*). Criminal expertise variables that were not recorded or were unknown were coded as absent.

A frequency analysis was conducted to determine which criminal expertise actions in the studies outlined in Table 2 were present in the current sample (see Table 3). Blindfolding was the only variable present in the above-mentioned literature that was excluded, as it did not occur in the present sample. In total, 14 of the original 15 criminal expertise variables identified in the literature (see Table 2 in literature review) were included for the current study (see Table 3).

Table 3

Criminal Career and Criminal Expertise Variables

Criminal Career (C)		Single (N = 155)		Serial (N = 19)	
Expressive		*n*	%	*n*	%
	Assault	32	21%	5	26%
	Drugs	30	19%	1	5%
	Traffic	16	10%	2	11%
	Disorder	15	10%	1	5%
	Domestic Violence	14	9%	0	0%
	Harassment	10	6%	0	0%
	Arrest	7	5%	1	5%
	Damage/ Vandalism	5	3%	1	5%
	Legal	2	1%	0	0%
Instrumental					
	Burglary	38	25%	6	32%
	Theft	33	21%	4	21%
	Sexual	19	12%	8	42%
	Weapons	14	9%	3	16%
	Robbery	12	8%	3	16%

	13	8%	2	11%
Auto-theft	13	8%	2	11%
Fraud	11	7%	2	11%
Theft-related	4	3%	0	0%

Criminal Expertise (A)	Single (N = 191)		Serial (N = 27)	
Control Over the Victim	n	%	n	%
Brought own weapon	44	28%	4	21%
Targeted victim	19	12%	11	58%
Stalked victim	9	6%	1	5%
Undressed victim	54	35%	9	47%
Concealed victim's body	49	32%	7	37%
Moved victim's body from crime scene	30	19%	2	11%
Bound victim	16	10%	4	21%
Gagged victim	10	6%	3	16%
Control Over the Outcome				
Scouted crime scene	114	74%	10	53%
Protected identity	18	12%	2	11%
Removed or destroyed forensic evidence	76	49%	10	53%
Revisited crime scene	23	15%	1	5%
Dismembered victim's body	13	8%	1	5%
Staged crime scene	12	8%	1	5%

Analysis

The present study used Multi-Dimensional Scaling (MDS) analysis, particularly Smallest Space Analysis (SSA) to analyze thematic differences in homicide offenders' criminal career specialization themes and criminal expertise control subgroups. SSA is a multi-dimensional scaling analysis and hypothesis testing technique that visually represents the co-occurrences of variables in a three-dimensional space. The regional hypothesis states that variables in close proximity to one another in the same region of an SSA plot are thematically similar (Canter & Heritage, 1990; Salfati, 2000; Salfati & Canter, 1999). Specifically, it suggests that variables that appear closer to each other in the same region of the plot are more likely to co-occur.

The utility of this for the current study, allows to test for the hypothesized themes made up of subgroups of co-occurring variables in offenders' backgrounds or crime scenes (Salfati, 2000). Specifically, SSA has been used to examine differences in themes of homicide offenders' crime scene actions (A) as well as characteristics (C) (Salfati, 2000; Sorochinski & Salfati, 2010;

Trojan & Salfati, 2010). Therefore, the current study used SSA to examine the co-occurrence of offenses in homicide offenders' backgrounds to classify them into criminal career themes, and to examine the co-occurrences of criminal expertise actions in homicide offenders' first homicides to classify them into subgroups of control. A separate SSA was conducted for criminal career specialization and criminal expertise to test the hypothesized themes.

The coefficient of alienation is used to establish how well the SSA represents the actual co-occurrences of the variables tested, with a coefficient below .20 being considered representative of a good fit (Borg & Lingoes, 1987; Salfati, 2000; Salfati & Bateman, 2005).

Results

### Aim 1: Comparing Serial and Single Homicide Offenders' Criminal Careers

Criminal Career Specialization: Expressive vs. Instrumental

The current study aimed to differentiate serial and single homicide offenders' criminal careers. The first step was to establish serial and single homicide offenders' criminal career specializations using the expressive and instrumental framework. The aim one analysis used Smallest Space Analysis (SSA) to test the co-occurrence of the nine expressive offenses and the co-occurrence of the eight instrumental offenses in homicide offenders' criminal backgrounds based on the literature as outlined in Table 1, to ultimately test the hypothesized expressive and instrumental criminal career specialization themes (see Figure 2). 27 serial and 191 single homicide offenders with and without criminal histories were included in the aim one analysis.

The SSA plot in Figure 2 confirmed the hypothesized two themes (see Table 1), expressive and instrumental, by showing two spatially distinct regions in the plot, one for each hypothesized theme. The coefficient of alienation was .14, suggesting the SSA plot was a very good fit for the true relationships between the variables in the cases.

Figure 2

SSA Showing a 3D Representation of the Thematic Division of Homicide Offenders' Criminal

Career Specializations Using The Expressive And Instrumental Framework
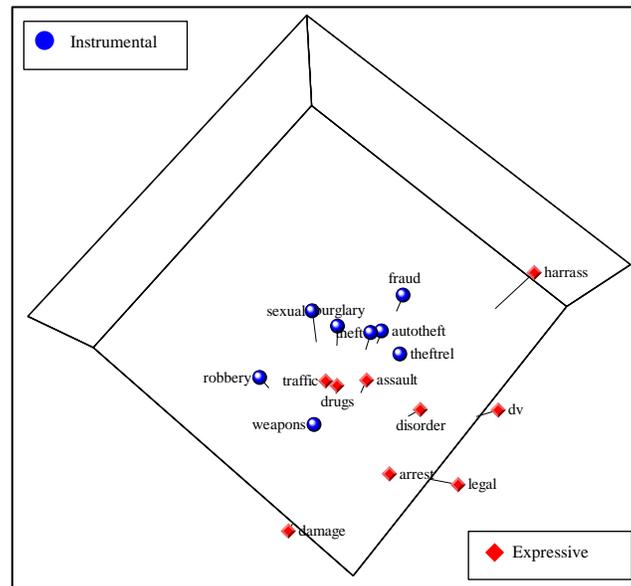
Notes: Coefficient of alientation: .14. The SSA plot is based on a total of 174 homicide offenders' criminal histories, of which 19 are serial and 155 are single homicide offenders. Homicide offenders without criminal histories (eight serial and 36 single) were not included in the SSA as they did not have any criminal offenses.

Expressive Offenses. The hypothesized expressive theme as outlined in Table 1 was

confirmed. The expressive offenses all co-occurred on the right side of the plot in Figure 2,

forming a distinct, and spatially separate sub-group. The expressive theme comprised offenses

where the offender's primary motivation was to physically or verbally cause harm to an individual

or property, with the offense itself being the main reward. The expressive theme was comprised

of a combination of offenses examined in Trojan and Salfati (2010), Salfati (2000) and Youngs et

al. (2016) as outlined in Table 1.

Instrumental Offenses. The hypothesized instrumental theme as outlined in Table 1 was

confirmed. The instrumental offenses co-occurred on the plot in Figure 2 to the left of the

expressive offenses, forming a distinct, and spatially separate sub-group. The instrumental theme

included offenses where the offender's primary motivation was to obtain something of value from another individual. The instrumental theme was comprised of the combination of offenses examined in Trojan and Salfati (2010), Salfati (2000) and Youngs et al. (2016) as outlined in Table 1. Furthermore, most instrumental offenses were clustered close together, however robbery and weapon offenses formed a separate cluster. Researchers have theorized that offenders with both robbery and weapons offenses in their backgrounds may be more willing than other offenders with instrumental offenses in their backgrounds to use violence or the threat of violence to achieve their main goal of taking something from the victim (Youngs et al., 2016).

Classifying Criminal Careers Using the Expressive and Instrumental Framework

The next step was to classify serial and single homicide offenders' criminal careers to establish differences in their criminal history backgrounds. Using Salfati's (2000) stringent classification criteria, homicide offenders with more than two times the percent of offenses in one theme over the other theme were identified as criminal career specialists. The stringent criteria was used as it has been most consistently used in the literature to classify dominant thematic offender characteristic and crime scene action groups (Salfati, 2000; Trojan & Salfati, 2010; Sorochinski & Salfati, 2010). With this criteria, just over half of homicide offenders with criminal histories (out of 174), 57% ($n = 100$) could be classified as either instrumental or expressive criminal career specialists. Of the 100 homicide offenders who could be classified as specialists, 51% ($n = 51$ out if 100) were instrumental and 49% ($n = 49$ out of 100) were expressive criminal career specialists. The remaining 43% ($n = 74$ out of 174) of homicide offenders who could not be classified to a dominant theme, were classified as generalists.

Differences in Serial and Single Homicide Offenders' Criminal Careers

Once serial and single homicide offenders were classified as criminal career specialists or generalists, the final step was to compare all serial and single homicide offenders to differentiate their criminal careers. A chi-square test was used to compare the homicide offenders with criminal histories ($N = 174$) across expressive specialist, instrumental specialist and generalist groups, and to compare serial and single homicide offenders ($N = 218$) without criminal histories (see results in Table 4 below).

Table 4

Differences in Serial and Single Homicide Offenders' Criminal Careers

With Criminal History	Expressive Specialist ($n = 49$)		Instrumental Specialist ($n = 51$)		Generalist ($n = 74$)	
	n	%	*n*	%	*n*	%
Serial ($N = 19$)	0	0%	11	58%	8	42%
Single ($N = 155$)	49	32%	40	26%	66	42%
Chi square test	$\chi^2 (1) = 8.3$		$\chi^2 (1) = 8.4$		$\chi^2 (1) = 6.85$	
Significance level	$p = .004$		$p = .004$		$p = .97$ [*ns*]	

Without Criminal History	No Criminal History ($n = 44$)	
	n	%
Serial ($N = 27$)	8	30%
Single ($N = 191$)	36	19%
Chi square test	$\chi^2 (1) = 1.7$	
Significance level	$p = .191$	

Of the homicide offenders with criminal histories, serial homicide offenders were significantly more likely to have instrumental offense backgrounds, $X^2 (1, N = 174) = 8.4, p = .004$, and single homicide offenders were significantly more likely to have expressive offense backgrounds, $X^2 (1, N = 174) = 8.3, p = .004$. Furthermore, all of the serial homicide offender criminal career specialists (100% ($n = 11$)) were instrumental. Of the single homicide offender

specialists, 55% ($n = 49$) were expressive and 45% ($n = 40$) were instrumental. Comparably, 42% ($n = 8$) of serial homicide offenders and 42% ($n = 66$) of single homicide offenders were generalists, X^2 (1, $N = 174$) = 6.85, $p = .97$.

In comparing the entire sample of homicide offenders, 30% ($n = 8$) of serial homicide offenders had no criminal histories, while 19% ($n = 36$) of single homicide offenders had no criminal histories. They did not significantly differ, X^2 (1, $N = 174$) = 1.7, $p = .191$.

Summary

For aim one, the current study sought to differentiate serial and single homicide offenders' criminal careers. The SSA confirmed that homicide offenders' criminal histories did display two distinct offense backgrounds of expressive and instrumental themes. Serial and single homicide offenders' criminal careers were then classified, showing that serial homicide offenders were more likely to be instrumental specialists and single homicide offenders more likely to be expressive specialists. The remaining serial and single homicide offenders with criminal histories were classified as generalists due to their versatile offense backgrounds, and did not significantly differ. Serial and single homicide offenders were both likely to have no prior criminal history.

Aim 2: Differentiating Offender Crime Scene Actions By Criminal Expertise

The second aim was to differentiate serial and single homicide offenders' criminal expertise crime scene actions used in their first homicides by instrumental subgroups of control. 27 serial and 191 single homicide offenders were included in the analysis. The analysis was done using SSA to test the differentiation of the hypothesized instrumental criminal expertise crime scene themes of control over the victim (8 crime scene actions) and control over the outcome (6 crime scene actions) (see Table 2), in serial and single homicide offenders' first homicides (see Figure 3).

The SSA plot in Figure 3 confirmed the hypothesized two themes (see Table 2), of control over the victim and control over the outcome, by showing two spatially distinct regions in the plot, one for each hypothesized theme. The coefficient of alienation was .11, suggesting the SSA plot was an excellent fit to the association matrix.

Figure 3

SSA Showing a 3D Representation of the Thematic Division of Homicide Offenders' Criminal Expertise Actions Using Instrumental Subgroups of Control
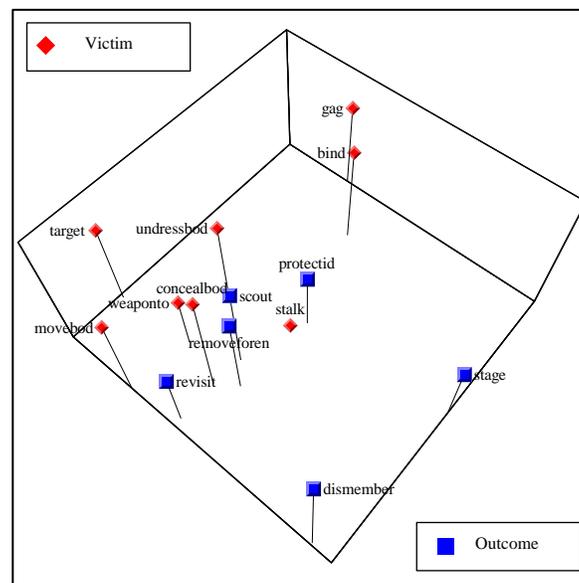
Notes: Coefficient of alienation: .11. The SSA plot is based on a total of 218 homicide cases, of which 27 are serial and 191 are single homicides. 19 serial and 155 single homicide offenders had criminal histories. 8 serial and 36 single homicide offenders had no criminal histories.

Criminal Expertise: Control Over the Victim vs. Control over the Outcome

Control Over the Victim. The hypothesized control over the victim instrumental subgroup as outlined in Table 1 was confirmed. The criminal expertise actions in this theme co-occurred on the left side of the SSA plot, forming a distinct, and spatially separate sub-group (see Figure 3). The control over the victim subgroup included actions used by the offender to physically and/or psychologically control the victim to ultimately execute the homicide and avoid detection (Horning et al., 2010).

Control Over the Outcome. The hypothesized control over the outcome instrumental subgroup as outlined in Table 1 was confirmed. The criminal expertise actions in this theme co-occurred on the left side of the SSA plot, forming a distinct, and spatially separate sub-group (see Figure 3). The control over the outcome subgroup included actions employed by an offender to control the physical crime scene environment to avoid detection (Horning et al., 2010).

Classification of Criminal Expertise Actions Using Instrumental Subgroups of Control

Because the SSA revealed a thematic split between homicide offenders' control over the victim and control over the outcome subgroups, the next step was to classify their criminal expertise actions into a dominant control subgroup to establish differences in their use of criminal expertise in their first homicides. Homicide offenders were classified into a dominant control subgroup if they had more than two times the percentage of crime scene actions in one subgroup than the other subgroup, using Salfati's (2000) stringent classification criteria. Crime scenes with approximately 50% of their actions in each control subgroup were classified as hybrid, whereas crime scene that could not be classified as dominant or hybrid were deemed unclassifiable (Salfati, 2000). 70% of homicide offenders could be classified to either control over the victim, control over the outcome or a hybrid of control subgroups, whereas 30% of homicide offenders' crime scenes were unclassifiable. Further, just over half of homicide offenders, 55% ($n = 120$), could be classified into a control subgroup.

Differences in Serial and Single Homicide Offenders' Criminal Expertise

Once homicide offenders were classified into dominant subgroups of control, hybrid and unclassifiable crime scene groups, the next step was to use a chi-square test to compare serial and single homicide offenders to establish differences in the criminal expertise actions displayed in their first homicides (see Table 5).

Table 5

Differences in Serial and Single Homicide Offenders' Criminal Expertise

Homicide Offender	Criminal Expertise							
	Control over the Victim ($n = 38$)		Control over the Outcome ($n = 82$)		Hybrid ($n = 32$)		Unclassifiable ($n = 66$)	
	n	%	*n*	%	*n*	%	*n*	%
Serial ($N = 27$)	6	22%	6	22%	4	15%	11	41%
Single ($N = 191$)	32	17%	76	40%	28	15%	55	29%
Chi square test	$\chi 2 (1) = .49$		$\chi 2 (1) = 3.1$		$\chi 2 (1) = .0$		$\chi 2 (1) = 1.6$	
Significance level	$p = .587$[a] [*ns*]		$p = .078$ [*ns*]		$p = 1.00$[a] [*ns*]		$p = .20$ [*ns*]	

[a] Fisher's exact test.

Of the 55% of crime scenes that could be classified to a dominant control subgroup, 44% ($n = 12$) of serial homicide offenders and 57% ($n = 108$) of single homicide offenders could be classified. There were no significant differences in serial and single homicide offenders' classifications across subgroups of control, nor across hybrid or unclassifiable groups.

Summary

The second study aim sought to differentiate serial and single homicide offenders' criminal expertise actions using the instrumental subgroups of control. The SSA showed that homicide offenders' crime scenes did display two distinct subgroups of control over the victim and control over the outcome. Aim two results showed that serial and single homicide offenders both with and without criminal histories did not significantly differ across subgroups of control, and thus did not differ in their use of criminal expertise in their first homicides. Following, the final step of the present study was to examine the relationship between serial and single homicide offenders' criminal careers and criminal expertise used in their first homicides.

Aim 3: Linking Criminal Careers with Criminal Expertise

The third aim was to examine the relationship between serial and single homicide offenders' criminal careers and criminal expertise employed during their first homicides. 27 serial

and 191 single homicide offenders were included in the aim three analysis. The analysis used a chi-square test to analyze differences in the relationships between serial and single homicide offenders' dominant criminal careers and dominant criminal expertise groups (see Table 6).

Table 6

Linking Serial and Single Homicide Offenders' Criminal Careers with Criminal Expertise

	Criminal Expertise				
Criminal Career	Control Over the Victim (*n* = 41)		Control Over the Outcome (*n* = 79)		Chi square and significance
Serial (*n* = 12)	*n*	%	*n*	%	
Expressive Specialist (*n* = 0)	0	0%	0	0%	–
Instrumental Specialist (*n* = 6)	3	50%	3	50%	$\chi 2$ (1) = .625, *p* = .57[a] [*ns*]
Generalist (*n* = 4)	3	75%	1	25%	$\chi 2$ (1) = .625, *p* = .57[a] [*ns*]
No Criminal History (*n* = 2)	0	0%	2	100%	$\chi 2$ (1) = .773, *p* = 1.0[a] [*ns*]
Single (*n* = 108)					
Expressive Specialist (*n* = 28)	4	15%	24	85%	$\chi 2$ (1) = 4.76, *p* = .029
Instrumental Specialist (*n* = 25)	14	56%	11	44%	$\chi 2$ (1) = 3.33, *p* = .69 [*ns*]
Generalist (*n* = 34)	11	32%	23	68%	$\chi 2$ (1) = .162, *p* = .069 [*ns*]
No Criminal History (*n* = 21)	6	29%	15	71%	$\chi 2$ (1) = .773, *p* = 1.0[a] [*ns*]

[a] Fisher's exact test.

Table 6 includes a breakdown of serial and single homicide offenders by their criminal careers who could be classified into a dominant criminal expertise group. This includes 55% (120 out of 218) of homicide offenders in the current sample. 45% (98 out of 218) of homicide offenders in the current sample who were classified into a dominant criminal career group could not be classified into a dominant criminal expertise group, and instead, employed a variety of criminal expertise behaviors at a hybrid or an unclassifiable level. They were not included in the final analysis as they represent a subset of the current sample who did not show any significant thematic dominance in their crime scene, and therefore, their crime scenes would not provide enough information to differentiate homicide offenders and narrow down the suspect pool to the most likely type of homicide offender.

For expressive criminal career specialists, the majority of offenses in their backgrounds are carried out against a victim or property (e.g. crimes including assault and damage), where the main goal is to cause harm. Out of the 55% of the sample, single homicide offender expressive criminal career specialists were more likely to control the outcome *(N = 24, 85%)* (e.g. actions including removing forensic evidence, revisiting and staging the crime scene) than to control the victim (*N* = 4, 15%) (e.g. actions including targeting, stalking and gagging the victim) in their first homicides, X^2 (1, *N* = 108) = 4.76, *p* = .029 (see Table 6).

For instrumental criminal career specialists, the majority of crimes in their backgrounds (e.g. crimes including sexual assault and theft) are characterized by their main goal to gain something of value from the victim. For the serial homicide offenders in this subgroup, 50% (*N* = 3) controlled the outcome and 50% (*N* = 3) controlled the victim. For the single homicide offenders in this subgroup, 44% (*N* = 11) controlled the outcome and 56% (*N* = 14) controlled the victim. Both serial homicide offenders, X^2 (1, *N* = 44) = .625, *p* = .57, and single homicide offenders, X^2 (1, *N* = 108) = 3.33, *p* = .69, with instrumental criminal careers were likely to fall into either instrumental subgroup of control, suggesting that serial and single homicide offenders with instrumental criminal careers behaved indistinguishably in the criminal expertise used in their first homicides.

Serial homicide offender, X^2 (1, *N* = 44) = .625, *p* = .57, and single homicide offender criminal career generalists, X^2 (1, *N* = 108) = .162, *p* = .069, who did not specialize in expressive or instrumental offenses, but rather, maintained versatile criminal careers prior to their first homicides did not significantly differ across subgroups of control. While the difference was not significant, a larger proportion of serial homicide offender generalists controlled the victim (*N* = 3, 75%) compared to the outcome (*N* = 1, 25%), and a larger proportion of single homicide

offenders controlled the outcome ($N = 3$, 75%) compared to the victim ($N = 3$, 75%). Further, both serial and single homicide offenders without prior criminal histories did not significantly differ across subgroups of control. The serial homicide offenders without criminal histories controlled the outcome ($N = 2$, 100%), but did not control the victim in their first homicide, X^2 (1, $N = 44$) = .773, $p = 1.0$. While insignificant, a larger proportion of single homicide offenders without criminal histories controlled the outcome ($N = 15$, 71%), compared to the victim ($N = 6$, 29%) in their first homicides, X^2 (1, $N = 44$) = .773, $p = 1.0$.

While these results may provide some initial insight into the understanding of the relationship between the criminal careers and criminal expertise actions of serial and single homicide offenders, the subgroups represented in Table 6 are too small to provide a useful analysis of such, particularly as the number of homicide offenders in the majority of subgroups fell within the single digits. The associated limitations will be considered in the discussion.

Summary

The third study aim examined the relationship between serial and single homicide offenders' criminal careers and criminal expertise used in their first homicide. Aim three results indicated that single homicide offender expressive criminal career specialists were more likely to control the outcome of their first homicide. Furthermore, serial and single homicide offenders with instrumental specialist, generalist and no criminal history criminal career backgrounds did not significantly differ by subgroups of control.

Discussion

While the literature suggests there is a relationship between offenders with prior criminal experience and use of criminal expertise in future crimes, no studies to-date have examined this relationship in serial and single homicide offenders despite evidence that suggests they are both

likely to be criminally involved before committing their first homicide (Beauregard & Martineau, 2013; 2014; ; Chopin et al., 2020; DeLisi & Scherer, 2006; Edelstein, 2016; Harbort & Mokros, 2001; Park, 2008; Sturup, 2018). The current study examined the thematic relationship between serial and single homicide offenders' criminal careers (C) and the criminal expertise actions (A) employed in their first homicides to identify significant behavioral differences across divergent criminal career backgrounds that may help to narrow down the suspect pool in investigations to the most likely type of homicide offender in terms of their criminal career background. The results showed that single homicide offenders with expressive criminal careers, where majority of the offenses in their backgrounds were violent acts carried out against a victim or property with the main goal was to cause harm, were more likely to control the outcome of their first homicides. The remainder of single and serial homicide offenders were just as likely to control the outcome and the victim of their first homicide regardless of criminal career background. These findings suggest that generally, when examining homicide offenders' criminal expertise actions, serial and single homicide offenders' first homicides look similar.

Comparing Serial and Single Homicide Offenders' Criminal Careers

As a first step to examine the A➔C for homicide offenders, the study differentiated serial and single homicide offenders' criminal careers (C). The results indicated that serial homicide offenders were significantly more likely to specialize in instrumental offenses and single homicide offenders were significantly more likely to specialize in expressive offenses. These differences in serial and single homicide offenders' criminal career specializations complement Trojan and Salfati's (2010) study, which was expected, as the same dataset was used. However, dissimilar to Trojan and Salfati (2010), legal, drug, disorder and traffic offenses were predicted and found to co-occur in the expressive theme, based on Youngs et al.'s (2016) research on offender criminal

career specialization. Youngs et al. (2016) stated that expressive aggression has been characterized as both an emotional and impulsive response to perceived threats. Youngs et al. (2016) therefore hypothesized that legal offenses would co-occur in the expressive theme in offenders' backgrounds because they represent an offender's main goal to avoid the potential threat of criminal ramifications through use of violence. Youngs et al. (2016) also included drug, disorder and traffic offenses in the expressive theme, noting they have been found to be strongly associated with violent behaviors and influence the use of violence. Furthermore, while Trojan and Salfati (2010) predicted that sexual offenses would co-occur with offenses in the expressive theme of serial and single homicide offenders' criminal career backgrounds they found that sexual offenses co-occurred in the instrumental theme. Further, Salfati (2000) and Youngs et al. (2016) also found that sexual offenses co-occurred in the instrumental theme of single homicide and general offender backgrounds respectively, based on the hypothesis that sexual offenses represent an offender's primary goal to obtain something of value from the victim. The current study predicted and found that sexual offenses occurred in the instrumental theme of the current sample, further supporting the finding that sexual offenses are likely to co-occur in the instrumental backgrounds of serial and single homicide offenders when examining their criminal careers together.

A minority of both serial and single homicide offenders had no criminal histories, which is in line with prior research (Beauregard & Martineau, 2013; 2014; DeLisi & Scherer, 2006; Harbort & Mokros, 2001; Sturup, 2018). Yet, while they did not significantly differ, 30% of serial homicide offenders compared to 19% of single homicide offenders had no criminal histories, which suggests additional research may be needed to examine potential differences in serial and single homicide offenders' without criminal histories to further improve the offender profiling equation. An equal percentage (42%) of both serial and single homicide offenders were found to be generalists, which

is also supported by prior research (Trojan & Salfati, 2010; Wright et al., 2008). However, this large percentage poses potential issues in differentiating homicide offenders by their criminal career specializations and linking to their dominant crime scene actions to inform profiling.

Differentiating Offender Crime Scene Actions By Criminal Expertise

Second, no studies to-date have used the same thematic framework to classify both serial and single homicide offenders' criminal expertise actions. Therefore, the current study employed the instrumental subgroups of control framework from Horning et al. (2010) to differentiate criminal expertise actions (A) in serial and single homicide offenders' first homicides. The results showed that both serial and single homicide offenders' criminal expertise actions could be differentiated into these two distinct subgroups of control, although they did not significantly differ. Furthermore, the results provide support for the expansion of the subgroups of control framework used in Horning et al. (2010) (including the variables binding, gagging, removing forensic evidence and scouting out the crime scene), to include additional criminal expertise variables used in Sorochinski and Salfati (2010), Beauregard and Martineau (2013) and Chopin et al. (2020) to differentiate serial and single homicide offenders (see Table 2).

Specifically for the control over the victim subgroup, bringing a weapon was included as it has been interpreted as preparation taken to ensure an offender's ability to threaten and control the victim if necessary (Beauregard & Martineau, 2013; Salfati & Taylor, 2006; Sorochinski & Salfati, 2010; Youngs et al., 2016). Both stalking and targeting the victim were also included in this subgroup, as they have been surmised to represent the psychological need for an offender to control their victim to avoid detection, because they both involve controlling actions such as acquiring knowledge about their schedule, where they live and work, and their level of vulnerability (Chopin et al., 2020; Beauregard & Martineau, 2013; Sorochinski & Salfati, 2010;

Pecino-Latorre et al., 2019). Lastly, concealing the victim's body, moving the victim's body from the original crime scene and undressing the victim's body are forensic awareness strategies used by an offender post-mortem to delay and obstruct an investigation through hiding and/or tampering with the victim's body; actions which have been theorized to represent an offender's psychological need for power and control over the victim as well (Beauregard & Field, 2008; Beauregard & Martineau 2013; 2014; Chopin et al., 2020; Ferguson, 2019; Salfati & Taylor, 2006; Sorochinski & Salfati, 2010; Pecino-Latorre et al., 2019).

For the control over the outcome subgroup, protecting one's identity (e.g. wearing a mask and/or gloves) was included as it requires the planning needed to avoid leaving forensic evidence at the physical crime scene environment (Beauregard & Bouchard, 2010; Beauregard & Martineau, 2013; Chopin et al., 2020). Staging requires the control needed to make the physical crime scene environment appear as if it were not a homicide (e.g. to disguise the homicide as a suicide or an accidental death), and revisiting the crime scene represents an offenders' need for psychological control of the outcome by returning to ensure all incriminating evidence is hidden or removed (Chopin et al., 2020; Beauregard & Martineau, 2013; Ferguson, 2019; Sorochinski & Salfati, 2010). Dismembering the victim's body allows homicide offenders to multiply the areas in which the homicide could have first occurred, significantly complicating the investigation through controlling the physical crime scene environment to avoid detection (Chopin et al., 2020; Häkkänen-Nyholm et al., 2009; Sorochinski & Salfati, 2010).

Linking Criminal Careers with Criminal Expertise

Finally, the study sought to link homicide offenders' criminal careers (C) and criminal expertise actions (A) to determine if serial and single homicide offenders could be differentiated by just their first homicides. While the results suggest that the majority of serial and single

homicide offenders' first homicides look similar, the associations between their criminal careers and criminal expertise actions may be explained by different psychological characterizations of the A to C relationship.

Expressive Specialists. Only single homicide offenders were classified as expressive specialists. Further, single homicide offender expressive specialists were significantly more likely to control the outcome than the victim in their first homicide, suggesting they may represent a distinct group of homicide offenders. They may have maintained the same goal to cause harm or death to the victim (where the act of the offense was the main reward itself) throughout their criminal career, including their first homicide. Therefore within their first homicide, they may have behaved in a similar, characteristically reactive, impulsive and expressive manner to kill their victim. This may have increased the necessity to employ criminal expertise *after* the physical act of murder to avoid detection. This follows, as a larger proportion of control over the outcome subgroup variables are associated with post-planning behaviors including dismembering the victim's body, removing or destroying forensic evidence, and staging and revisiting the crime scene (Sorochinski & Salfati, 2010). A smaller group of single homicide offenders with expressive criminal careers controlled the victim. The actions in the control over the victim subgroup require a greater use of physical violence against the victim to carry out the homicide to avoid detection (e.g. binding and gagging the victim, bringing a weapon, undressing, concealing or moving the victim's body) (Beauregard & Field, 2008; Beauregard & Martineau 2013; 2014; Chopin et al., 2020; Ferguson, 2019; Salfati & Taylor, 2006; Sorochinski & Salfati, 2010; Pecino-Latorre et al., 2019). Furthermore, a larger proportion of the control over the victim subgroup variables are behaviors employed either *prior* to the homicide such as bringing a weapon, stalking and targeting the victim, or are employed *during* the homicide to adapt to threats to their detection, including

binding and gagging their victim (Harbort & Mokros, 2001; Salfati & Park, 2007; Sorochinski & Salfati, 2010). This may indicate that single homicide offenders with expressive criminal careers who controlled the victim in their first homicide were more likely to use violence to complete their homicide successfully and avoid detection, and were also more prepared prior to committing the homicide compared to those who controlled the outcome.

Instrumental Specialists. Both serial and single homicide offenders with instrumental criminal careers were similarly likely to control the outcome and the victim in their first homicide. Instrumental criminal career specialists' backgrounds included crimes such as theft, burglary and sexual assault, where their main goal was to obtain something of value from their victim. Based on the assumption that offenders are thematically consistent across their criminal careers, it follows that homicide offenders with instrumental criminal careers employed criminal expertise in a similar way, regardless of whether the homicide was a first homicide or the beginning of a larger series (Salfati, 2000; Salfati, 2008b; Youngs et al., 2016). Further, because homicide offenders with instrumental criminal careers were fairly evenly split across subgroups of control, this may indicate that they were willing to do whatever necessary in their first homicide to both obtain what they needed from the victim (e.g. money or sex) and ultimately avoid detection.

Generalists. Serial and single homicide offender criminal career generalists did not significantly differ across subgroups of control either. However, the characterization of the psychological relationship between their criminal career backgrounds and the criminal expertise they used in their first homicides may differ from the instrumental specialists. Homicide offenders with generalist backgrounds who controlled the outcome may have been less comfortable using physical violence to obtain their goals, which may suggest that their criminal career backgrounds consist of offenses where they also avoided physical violence. Thus, they may have relied on

behaviors that do not require the overt use of violence to control the outcome in their first homicide, such as protecting their identity or revisiting the crime scene (Beauregard & Bouchard, 2010; Beauregard & Martineau, 2013; Chopin et al., 2020; Ferguson, 2019; Sorochinski & Salfati, 2010). In cases where homicide offenders with generalist backgrounds controlled the victim, this may suggest that their criminal careers backgrounds consisted of offenses where violence and aggression were a significant element present regardless of the type of offense. Therefore, they may be more comfortable with actions related to physically controlling or threatening the victim with violence in their first homicides, such as binding and gagging the victim as well as bringing a weapon (Beauregard & Martineau, 2013; Chopin et al., 2020; Horning et al., 2010; Salfati & Taylor, 2006; Sorochinski & Salfati, 2010; Youngs et al., 2016).

       No Criminal History. Lastly, serial and single homicide offenders without prior criminal histories did not significantly differ across subgroups of control. Within this subgroup, although the differences were insignificant, the serial homicide offenders only controlled the outcome and a larger proportion of single homicide offenders controlled the outcome than the victim. This subgroup of homicide offenders may be similar to the expressive criminal career specialists who controlled the outcome of their first homicide; they may have acted in a more impulsive manner, and therefore had a greater need to cover-up any evidence *after* committing the homicide. There were no serial homicide offenders who controlled the victim in this subgroup. Whereas the single homicide offenders who controlled the victim of their first homicides may have been more likely to use violence in their everyday lives and therefore were more comfortable using violence against the victim to execute their homicide and avoid detection. Lastly, it is also possible that some homicide offenders within this subgroup engaged in such high levels of criminal expertise throughout their criminal careers that they continuously evaded detection and apprehension until

their first homicide conviction (Lammers et al., 2012). Therefore, in order to further parse out the

A➔C equation in the context of the current study, it may be necessary to examine additional salient

characteristics besides prior offenses in the small group of homicide offenders without criminal

histories. For example, recent studies found that other characteristics besides prior criminal

involvement may influence the development of criminal expertise, such as acquiring law

enforcement experience, watching crime television shows or maintaining a sexual collection

(Chopin et al., 2020; Ferguson, 2019).

      A➔C. 55% of serial and single homicide offenders' dominant criminal careers (C) could

be linked to their dominant criminal expertise actions (A), similar to Salfati (2000), who also found

that 55% of cases could be linked across A to C themes. However, the current study's subgroups

(see Table 6), are too small to provide a robust analysis, and therefore, while the results may

provide some insight about the relationship between the criminal careers of serial and single

homicide offenders, any significant conclusions made would be premature.

Limitations

      There are several limitations of the current study that may have led to the 45% of cases that

could not be linked across A to C themes. Specifically, 45% of cases were not accounted for,

because only 55% of cases were assigned to a dominant instrumental subgroup of control, despite

all (100%) cases being assigned to a dominant criminal career group. The classification criteria

used may have been too stringent, failing to capture small, yet significant behavioral variability in

homicide offenders' crime scenes. Further, several lower frequency variables (between 5% – 8%)

in both serial and single homicide offenders' crime scenes including stalking, dismembering the

victim's body and staging the crime scene may have influenced the number of cases that could be

classified. Thus, in terms of the practical applications for the current study, the findings should be interpreted with caution.

Future Directions

First, replication of the current study is necessary to address the limitations associated with small subgroup sizes as well as the crime scene classification criteria used, in order to validate any significant findings. Second, to develop a more robust understanding of differences among serial and single homicide offenders, future iterations of the current study could compare criminal expertise actions in each homicide in a series, beyond just the first homicide, to single homicides. If differences between serial and single homicide offenders' use of criminal expertise are found, this could help to inform offender profiling. For example, if serial homicide offenders are likely to employ different criminal expertise actions compared to single homicides further into their homicide series (e.g. their third and fourth homicides), this could provide support for differences among homicide offenders that may help to inform investigations.

Conclusion

The present study sought to link serial and single homicide offenders' criminal careers with the criminal expertise employed in their first homicides. The results revealed that single homicide offenders with expressive criminal careers were more likely to control the outcome of their first homicide, suggesting they may represent a distinct group of homicide offenders. Whereas, serial homicide offenders were just as likely to control the outcome and control the victim of their first homicide regardless of criminal career background. Furthermore, the majority of both serial and single homicide offenders' use of criminal expertise was similar across subgroups of control despite divergent criminal career backgrounds. Overall, the present study provides a first step in

differentiating serial and single homicide offenders by examining the relationship between their

criminal careers and criminal expertise.

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