The Temporal Stability and Cross-Situational Consistency of Behavioural Themes in Serial Homicide

By

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Abstract

Given an archival sample of 59 serial homicide offenders, the present research attempted to abide by the theoretical framework outlined in personality psychology to evaluate the basic tenets of profiling methods, namely the temporal stability and cross-situational consistency of serial offenders' behaviour. Through multidimensional scaling techniques, behavioural themes of control, hostility, and involvement were delineated along with associated scales. Offenders were then quantified on the degree to which they manifested these themes in the context of both the criminal domain (i.e., crime scene behaviours) and non-criminal domain (i.e., background characteristics). Stability and consistency were equated with the degree to which offenders maintained their respective rank orders along these quantitative scales over time and across situations, respectively. Adhering to this definitional criterion, the current sample was found to display high levels of temporal stability across respective crime series, thus supporting the conclusions of previous research. Although violated at a general level, the cross-situational consistency assumption was met under qualified conditions. Namely, levels of consistency were moderated by both offender type and the nature of the behavioural theme considered, with predominantly controlling offenders and the control theme itself displaying the highest levels of consistency (and stability) relative to the remaining offender types and behavioural themes. Practical and theoretical implications for methods of criminal profiling are discussed.

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Table of Contents

List of Tables

List of Figures

List of Appendices

The Temporal Stability and Cross-Situational Consistency of Behavioural Themes in Serial Homicide

Introduction

Criminal profiling involves the inferential derivation of an offender's likely personality traits, motivational states, and/or background characteristics from his[1] crime scene actions. Profiling has been applied most successfully to the investigation of serial crimes of an interpersonal nature (Douglas, Ressler, Burgess, & Hartman, 1986). In the absence of physical evidence, crimes such as serial homicide pose a particular challenge to police investigators. The difficulty arises due to the typical lack of acquaintance between victim and perpetrator prior to the offence, thus precluding the identification of a visible motive (Rossmo, 2000). In such cases, professional profilers are often contracted by law enforcement agencies to assist in 1) elucidating the issue of series identification (i.e., which crimes are linked), and 2) constructing a probabilistic template of the individual likely to have committed a given offence or series thereof (Blau, 1994; Canter, 1995). Ultimately, the objective of constructing a criminal profile is to generate a list of personality traits and related demographics that will allow police officers to prioritize potential suspects (Pinizzotto & Finkel, 1990).

While moderately favourable results have emanated from research conducted on the utility and contribution of profiling within the context of criminal investigations, these findings are based primarily on subjective *post hoc* reports (e.g., Jackson, Van Koppen, & Herbrink, 1993). Specifically, such studies survey police officers on the operational utility of offender profiling based on their experience with this investigative

[1] The masculine designation will be used throughout this thesis given that the vast majority of serial homicide offenders are male, as were all the subjects included in this investigation.

aid. Results indicate that the majority of officers perceive criminal profiling to play a supportive role in investigations. However, rather than offering a direct contribution to the resolution of a particular case, profiles appear to be most useful in furthering one's understanding of a case and/or in confirming one's *a priori* judgments regarding the likely characteristics of a suspect (Britton, 1992; Copson, 1995; Jackson et al., 1993).

A second stream of research pertains to the accuracy of professional profilers relative to other select groups, namely police officers, psychologists, university students, and psychics (Kocsis, 2003). Although overall results marginally favour profilers, the absolute accuracy scores of this group remain strikingly low (Bennell, Jones, Taylor, & Snook, 2004). For instance, the absolute accuracy level reported for professional profilers participating in a multiple-choice mock profiling task was approximately 45% (Kocsis, Harvey, Hayes, & Nunn, 2000). The meager success of criminal profilers in absolute terms may, in part, be related to what appears to be a major gap in the profiling-related literature. Despite product-related inquiry (i.e., research on profile accuracy and perceived utility), there is a conspicuous lack of research on process-related issues concerning the very foundational assumptions surrounding the construction of a criminal profile. Thus, it is generally unclear to profilers specifically which crime scene behaviours have the greatest predictive accuracy of background characteristics and which types of cases are most amenable to being profiled.

Assumptions Behind Offender Profiling

Although not customarily studied under this paradigm within the forensic literature, profiling methods are implicitly grounded in the naïve trait perspective (Alison, Bennell, Mokros, & Ormerod, 2002). A classic dispositional theory stemming

from the field of personality psychology, the tenets of the naïve trait approach underlie the following basic premises of offender profiling. First, it is assumed that an offender's behaviour will demonstrate *temporal stability*, with individual differences between offenders remaining stable over respective crime series. In statistical terms, the behavioural variation between offenders will exceed the behavioural variation within offenders (Alison et al., 2002). Second, it is expected that the behavioural themes that emerge across an offender's crimes will be *cross-situationally consistent* (i.e., offenders will display consistent patterns of behaviour across criminal and non-criminal domains). For purposes of illustration, consider two homicide offenders, A and B. Offender A exhibits a higher degree of aggression relative to offender B in the criminal arena, as specifically related to homicide (e.g., blitz attack, bludgeon, multiple stabbing, etc.). According to the consistency assumption, offender A will also demonstrate a greater degree of aggression than offender B in his non-criminal life, potentially exemplified by a history of juvenile criminal behaviour, spousal assault, and previous convictions for violent crimes.[2]

By drawing on a theoretical framework couched in personality psychology, the following thesis will endeavour to explore the validity of both the temporal stability and cross-situational consistency assumptions implicit in criminal profiling methods. These two concepts will initially be reviewed from a personality perspective and subsequently related to the forensic domain. As evident from both the personality and forensic literature, while there is empirical support for the criterion of temporal stability (e.g., Epstein, 1979; Hazelwood & Warren, 2003), the validity of the cross-situational

[2] While background characteristics may include prior criminal offences, these are nonetheless included in the 'non-criminal domain', since they do not pertain to the homicide series in question.

consistency assumption is vehemently debated to this date (e.g., Alison et al., 2002; Mischel, 1973). Therefore, in order to ameliorate levels of predictive validity currently typical of profiling methods, one must arguably transcend the antiquated theoretical underpinnings in which these techniques have been grounded.

The Personality Paradox: A Historical Debate

The naïve trait perspective.

A tenet generally supported by theorists such as Cattell (1950) and Epstein (1984), this classic conceptualization of personality posits that individuals are defined by a unique and finite set of stable, context-free dispositions. In turn, a person's stable constellation of traits will reliably determine his behavioural manifestations regardless of situational variants. Accordingly, it is postulated that one's particular traits and related behaviours will demonstrate both temporal stability and cross-situational consistency. Emerging within a given personality dimension, these individual differences provide the basis for comparing and contrasting individuals and groups (Endler & Magnusson, 1976). Intuitively appealing, this approach entails the convenience of predictive heuristics, allowing rapid inferences to be generated about one's likely behaviour in a removed temporal and situational context.

Before proceeding with this brief historical overview, certain definitional issues as conceptualized in the personality literature require clarification. First, the distinction between temporal stability and cross-situational consistency resides in the degree of physical and psychological similarity between the situations in question (Peake & Mischel, 1984). As typically viewed in the literature, one would apply the term 'temporal stability' when examining traits or behaviours across a series of situations that

are evidently similar to one another (e.g., a professor's behaviour across a series of lectures). Conversely, one is said to examine 'cross-situational consistency' when dealing with behaviours over situations that are apparently quite discrepant (e.g., a professor's behaviour in a lecture versus his behaviour at a family dinner). Clearly, no two situations mirror one another exactly so by the strictest of definitions, one could conceivably argue that temporal stability is merely a form of cross-situational consistency. However, while the lines between these two concepts may appear nebulous in certain instances, the distinction lies in the *degree* of situational similarity and as such, the terms are viewed as conceptually distinct (Endler & Magnusson, 1976).

While a variety of conceptions exist for stability and consistency, personality psychologists conventionally view these in *relative* as opposed to *absolute* terms. As depicted in Figure 1, a one-to-one correspondence in the level of trait manifestation across situations would exist if one were to define stability and consistency in absolute terms (Cervone & Shoda, 1999). By this definition, not only would Person A be repeatedly more aggressive than Person B, but the former would be expected to exhibit equally elevated levels of aggressive behaviour across a variety of situations.[3] However, the naïve trait perspective does not support the notion of an absolute standard for behavioural stability or consistency. According to this paradigm, while behaviour is at least generally subject to contextual effects, situational influences are viewed independently of personality (Shoda, 1999). In other words, the naïve trait approach considers the impact of situations by the very fact that it does *not* purport that one will

[3] Note that in the case of widely discrepant situations (e.g., a debate, argument with spouse, church service), one would be examining the cross-situational consistency assumption. One could easily examine temporal stability in this fashion by replacing the situations with, for example, three different occasions at a church service.

behave in the exact same manner across different (or even similar) situations. Accordingly, both temporal stability and cross-situational consistency are reflected in a *consistent rank ordering* of individuals' behaviours over time and across situations (Bem & Allen, 1974; Cervone & Shoda, 1999).

As illustrated in Figure 2, Person A will likely exhibit a lower degree of aggression during a church service (S3) than he would in the context of a debate (S1), or during an argument with his wife (S2). Nonetheless, he is expected to demonstrate a consistently greater degree of aggression across all three situations than would be displayed by Person B, as reflected in A and B's consistent rank-ordering across these situations. This interpretation of consistency/stability is the operational definition applied in the subsequently cited personality studies, as well as in the present thesis.

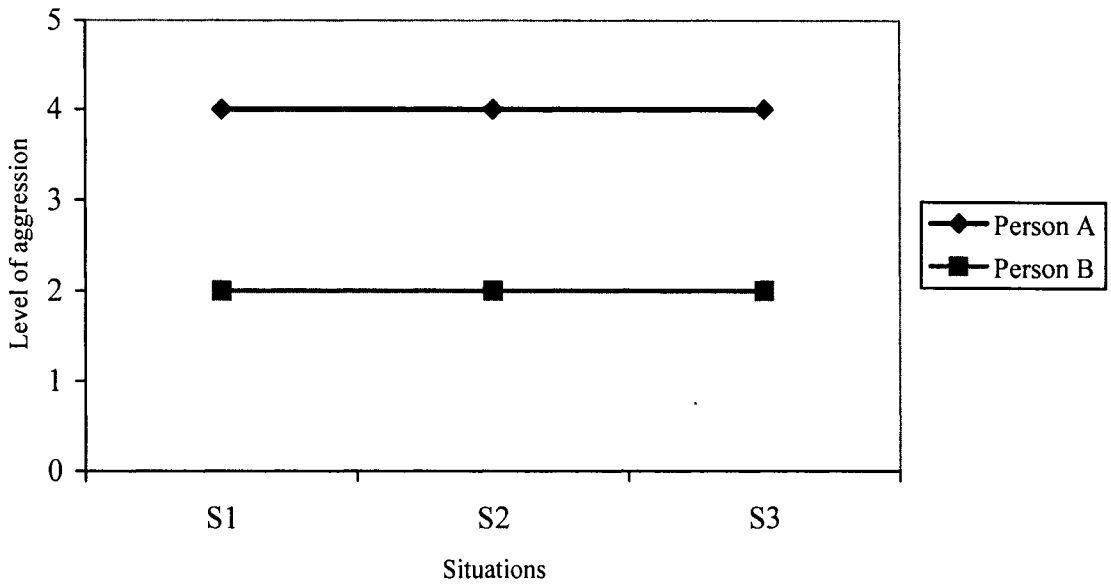


Figure 1. An absolute measure of stability/consistency.

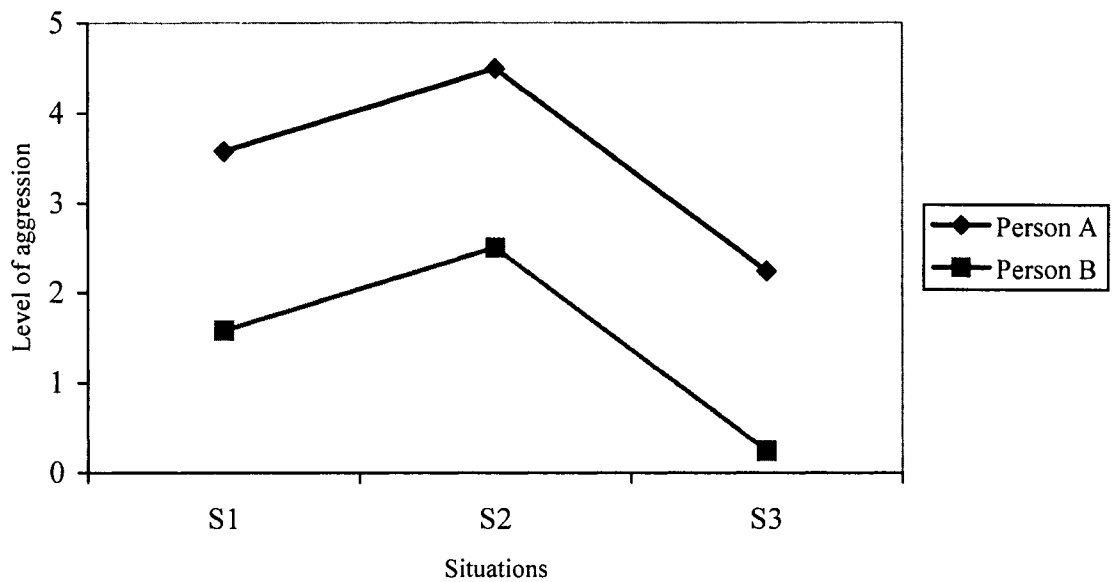


Figure 2. A relative measure of stability/consistency.

Evidence for temporal stability?

Empirically, the personality literature generally supports the temporal stability of traits or behavioural themes. Thus, in relative terms, an individual's behavioural profile across similar situations tends to demonstrate a high degree of stability over time (see Epstein, 1979; Mischel & Peake, 1982; Olweus, 1979; Shoda, Mischel, & Wright, 1994). For example, in an attempt to examine the stability of aggression in males, Olweus (1979) reviewed 16 relevant longitudinal studies. While most of these investigations focused on interpersonal aggression, aggressive reactivity was also considered (e.g., over-reactivity in response to minor frustration, irritability, etc.). Despite variability in both time intervals and methods of data collection across studies, overall results strongly support the stability of aggression, with Spearman coefficients ranging from .68 to .79 for a five-year period (i.e., age 12 to 17) (Olweus, 1979). Furthermore, as evidenced by Farrington (1978), aggressive reaction patterns in adolescence are predictive of antisocial behaviour in early adulthood. Similar results have been demonstrated with regards to several additional constructs including extraversion (Newcomb, 1929), compliance (Shoda, 1999), friendliness and conscientiousness (Mischel & Peake, 1982).

Evidence for cross-situational consistency?

Conversely, the validity of the cross-situational consistency assumption has been debated for nearly a century and is controversial to this day (Alison et al., 2002; Cervone & Shoda, 1999). While an impressive degree of consistency has been attributed to cognitive traits such as information-processing style and intelligence-related measures, social dimensions of behaviour (e.g., conscientiousness) demonstrate little evidence of

consistency (Kagan, 1969; Mischel, 1968). Although the pervasive view of generalized traits persisted intuitively among both scholars and the general public, a series of empirical studies conducted in the late 1920s and 1930s challenged the existence of highly broad and stable dispositions.

Accordingly, the following three studies are frequently cited as evidence against the naïve trait perspective. The first in the series was conducted by Hartshorne and May (1928). Over a six-year period, these authors observed a national cross-section of 8,000 American children, collecting various observationally-based measures purported to reflect the underlying trait of honesty or "moral character". Contrary to their original hypothesis in support of consistency, an average inter-item correlation of only .23 was obtained when considering moral behaviours across various situations. Therefore, it was concluded that honesty is not a unified trait but rather, "... a series of specific responses to specific situations" (Hartshorne & May, 1928, p. 243).

A similar study pertaining to the consistency of one's disposition towards introversion-extroversion was performed to investigate whether a broad trait could be ascribed to a sample of 51 young boys attending a summer camp (Newcomb, 1929). For several weeks and across 30 different situations, camp counsellors were required to keep detailed records of these boys on 30 behavioural items conceptually linked to the above dimension. These items were then organized into 10 distinct "traits" (e.g., ascendancy versus submission, volubility versus taciturnity), collectively defining introvert-extrovert types. Congruent with the findings of Hartshorne and May (1928), Newcomb (1929) reported marginal cross-situational consistency at the item level, and inter-correlations of only .14 at the trait level.

In contrast to the above investigations, the third study in the series applied a relatively strict definition of cross-situational consistency, exploring the relationship between *identical* behaviours across different situations (Dudycha, 1936). Interested in assessing the consistency of punctuality, Dudycha recorded 15,360 observations of over 300 college students across distinct forms of scheduled events. In each case, he recorded the number of minutes late (or early) of one's arrival to classes, meals, conferences, extracurricular activities, vespers, and entertainment events. Obtaining equally discouraging results, the mean cross-situational correlation yielded at the inter-item level was just .19.

The situationist perspective.

In conjunction with the increased prominence of stimulus-response behaviourism in the 1950s (Feist & Feist, 2002), studies such as those cited above served to fuel the situationist perspective in the personality debate. Considered a proponent of this position, Mischel (1968, 1973, 1999) objected to the claim that traits can serve as global predictors of behaviour. He contended not that features of one's personality lack temporal stability, but rather, that behavioural manifestations will fail to demonstrate consistency across discrepant situations due to contextual influences upon behaviour. More specifically, he argued that inter-item correlations between behaviours of which a particular trait is comprised will rarely exceed a .30 threshold. Furthermore, Mischel maintained that the lack of empirical support for the cross-situational consistency assumption is likely attributable to true behavioural variance rather than methodological error.

Providing additional support for his position, Mischel and Peake (1982) conducted what has been termed the Carleton College study, in which undergraduate students were assessed on various items related to constructs of conscientiousness and friendliness. As anticipated, mean inter-item correlations for the specified constructs were extremely low, respectively reported to be .08 and .13. In view of the evidence against the consistency assumption, Mischel (1999) reasoned that "traits" have limited predictive validity and therefore, one should view behavioural specificity across situations or "discriminativeness" as the rule rather than the exception.

The seemingly diametric opposition of the naïve trait and situationist perspectives on the subject of consistency led researchers to coin the term "personality paradox" (Bem & Allen, 1974). Indeed, there exists a discrepancy between empirical findings – which indicate low levels of cross-situational consistency - and one's fundamental assumption of personality – the intuitive tendency to infer stable, context-free dispositions as a determinant of behaviour. This apparent contradiction begs several questions: Is personality rendered unimportant relative to situational factors as a determinant of behaviour? Are these two positions reconcilable?

The interactionist perspective.

As stated by Endler and Hunt (1966), "the question of whether individual differences or situations are the major source of behavioural variance… turns out to be a pseudo-issue" (p. 344). While seemingly contradictory, the trait and situationist perspectives may indeed be reconcilable through an interactionist paradigm. According to this position, rather than seek answers to "either/or" questions that depict persons and situations as competing forces, it is more fruitful to examine the manner in which

individual differences interact with situations to yield behaviour. Endler and Magnusson (1976) argue that while an individual's behaviour is moulded by the situations he encounters, his personality and cognitive structures interact with the environment as he, in turn, actively selects and affects specific situations. Emerging from analysis of variance techniques, the majority of empirical studies concede that the *person x situation* interaction accounts for the largest proportion of variance, largely exceeding the variance accounted for by either of the main effects in isolation.

For example, Endler and Hunt (1966) endeavoured to assess the relative contribution of situations and individual differences on hostility. Results indicated that while individual differences and situations each only accounted for approximately 4% of the total variance, the *person x situation* interaction accounted for over 10%, with the largest proportion of variance accounted for by higher-order interactions (Endler & Magnusson, 1976). Similar findings are reported across a variety of samples and personality constructs (e.g., Bowers, 1973; Endler & Hunt, 1968; Raush, Dittman, & Taylor, 1959). The general consensus that interactions account for a greater proportion of variance than either of the main effects (i.e., the *person* or the *situation*) suggests that cross-situational consistency is unlikely to hold for behavioural themes, neither in absolute nor relative terms. Figure 3 illustrates the typical lack of consistency observed for two individuals, with notable incongruity in Person A and Person B's rank ordering in level of aggression exhibited across three different situations. For example, a number of personality and social factors may preclude Person B from overtly expressing aggression during a debate (S1) (e.g., if the debate is attended by a number of people, he may experience social anxiety or be extremely conscious of impression management).

However, Person B may perceive a one-on-one confrontation with a familiar individual, such as an argument with his wife (S2), to be a perfectly acceptable outlet for his aggression. Person A, in contrast, may thrive on public confrontation and thus express elevated levels of aggression in the context of a formal debate (S1), but may not be inclined to exhibit highly aggressive responses towards a spouse or intimate partner (S2).

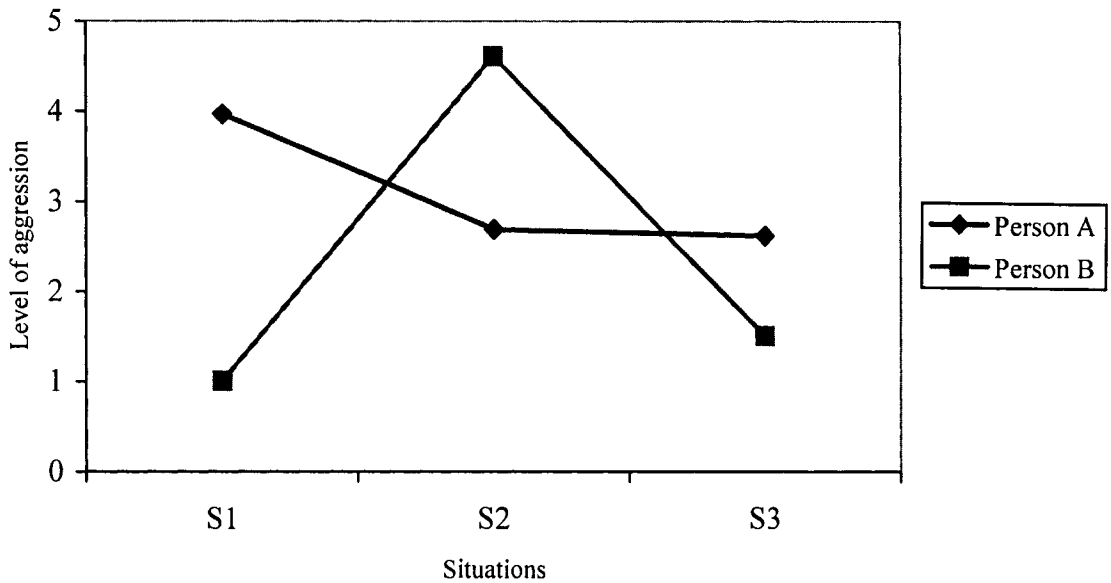


Figure 3. Lack of stability/consistency.

The literature in the personality domain generally does not support the widespread assumption that an individual will exhibit cross-situational consistency in his behavioural manifestations or traits. However, several methodological factors have demonstrated an impact on observed levels of consistency. Two such factors, namely the consideration of moderator variables and the practice of aggregation, may be applied directly in the forensic domain and will therefore be discussed in turn.

The Effect of Moderator Variables and Aggregation on Stability and Consistency

Moderator: The nature of the behaviour itself.

A moderator is defined as a factor that influences the strength of the relationship between a predictor and an outcome variable, by way of the variance it shares with this predictor variable.[4] In the personality literature, it has been argued that the relative contribution of *person* versus *situation* to an individual's behaviour may be influenced by certain moderating factors (Alker, 1972; Bem & Allen, 1974; Funder & Colvin, 1991).

In an examination of cross-situational consistency, Funder and Colvin (1991) explored a moderator equated to the nature of behaviour itself. Although the issue of variations in level of consistency has been explored as a function of individuals and situations (Bem & Allen, 1974; Michel & Peake, 1982), the causal mechanisms of behaviour have received little attention in this particular context. Funder and Colvin studied the behaviour of 140 undergraduate students across three different laboratory settings ranging in 1) degree of structure (e.g., *high structure* = required to debate a certain topic versus *low structure* = received no particular instructions), and 2) degree of

[4] This is to be distinguished from a mediator, which is correlated with an outcome variable solely by way of the variance it shares with a given predictor.

familiarity (e.g., *high familiarity* = required to interact with acquaintance versus *low familiarity* = required to interact with stranger). Videotaped interactions were evaluated via peer ratings in these laboratory contexts as well as in naturalistic settings. When both item variance and reliability were partialed out, the consistency correlations representing the differences between behaviours across situations remained highly significant (e.g., .84 versus .71). Furthermore, behavioural items that were highly consistent generally tended to be observed with higher frequency and had greater situational breadth than did less consistent items.

In order to generate a potential explanation for these findings, the authors turned to a theory loosely grounded in behaviourism. First articulated by McClelland (1984), there is a proposed distinction between operant and respondent behaviours. *Respondents* are defined as responses elicited by a clearly discernible stimulus (e.g., expression of sympathy towards partner). *Operants*, on the other hand, are behaviours emitted by an individual that are not preceded by an identifiable stimulus but are rather a reflection of spontaneous activity (e.g., fluent speech). This conceptualization implies that operants are expressed over a wider situational range than respondents and by extension, McClelland argued that operants would be characterized by a greater degree of cross-situational consistency. Funder and Colvin's analysis supported this hypothesis, demonstrating that behaviours most frequently classified as operants by an independent sample of judges tended to demonstrate the highest levels of consistency (ranging from .51 to .65). Conversely, the behaviours identified as respondents yielded the lowest levels of consistency (ranging from -.01 to .12). Therefore, there is evidence to suggest that the degree of observed cross-situational consistency is dependent upon the nature of

the behaviour in question, with higher degrees of consistency ascribed to responses that are less dependent upon situational factors versus those elicited by specific stimuli.

Moderator: Typing persons.

Bem and Allen (1974) suggest that it is possible to reconcile the consistency debate by adopting certain idiographic assumptions. On an *a priori* basis, they endeavoured to identify those individuals who would exhibit a greater degree of cross-situational consistency. Simply, they hypothesized that individuals who identify themselves as consistent on particular traits will exemplify greater consistency. Sixty-four university students were required to self-report perceived consistency on the constructs of conscientiousness and friendliness. On these grounds, each subject was classified as "low-variability" or "high-variability". The second part of the investigation involved conducting an actual (as opposed to perceived) assessment of cross-situational consistency on the two personality dimensions. Whenever possible, ratings of individuals were provided by their mother, father and a close peer (e.g., a roommate), after which the three independent ratings were combined into an aggregate consistency score for each trait. In accord with Bem and Allen's hypothesis, participants who perceived themselves to be less variable cross-situationally were indeed more consistent. On the construct of conscientiousness, the approximate mean inter-correlation for the low-variability group was .40 (versus .10 for the high-variability group). For friendliness, the mean inter-correlation for the low-variability group was .57 (versus .27 for the high-variability group).

Results of this investigation provide a first attempt to illustrate that it may indeed be possible to identify individuals (or groups) that are more apt to demonstrate cross-

situational consistency. However, one must recognize that from a practical standpoint, it may be unfeasible to obtain self-report measures from individuals on a purely idiographic basis in certain contexts - namely in criminal investigations. Nonetheless, one could potentially identify certain groups of offenders that, on average, would be more highly prone to demonstrate consistency. While this issue will be explored more extensively in the forthcoming section on offender typologies, the following study conducted in the personality domain provides further evidence for the possibility of observing consistency in select groups of individuals.

Similarly to Bem and Allen (1974), Alker (1972) predicted that the behavioural manifestations of certain populations on given traits may be more vitally affected by individual differences (i.e., *person* factors) than situations, thus entailing a greater degree of cross-situational consistency. More specifically, relative to "normal" subjects, individual differences were postulated to account for a greater proportion of variance for the construct of anxiousness in "disorganized" individuals displaying psychotic tendencies. Indeed, results confirmed that in the disorganized sample, individual differences accounted for the majority of the total variance (20%), exceeding both the situational variance and the *person x situation* component (5% and 8%, respectively). Conversely, with the normative sample, the *situation* accounted for the largest proportion of variance (about 24%), followed by the *person x situation* interaction (about 18%). However, the *person* component alone accounted for only 3% of the total variance.

Aggregation.

While several resolutions have been proposed in an attempt to reconcile the personality paradox, Epstein (1979) was the first to formally articulate the function of aggregation in this capacity. In fact, Epstein critiques the work of Mischel and similar proponents of the situationist camp on several grounds, at the forefront of which is the aggregation issue. He argues that while one's behaviour may exemplify low cross-situational consistency at the item level, it is considerably more stable and pervasive at the aggregate level. For example, as a single behavioural item, 'hitting' would likely demonstrate low levels of cross-situational consistency. However, when considering the theme of 'aggression', which may including hitting but is additionally comprised of a collection of psychologically or thematically related behaviours (e.g., yelling, kicking, etc.), one would expect a relatively higher degree of consistency to be exemplified across a series of situations.

The purpose of aggregation is twofold, serving to reduce error measurement while extending the generalizability of findings (Epstein, 1980). Regardless of the degree of objectivity associated with one's methodology, it is unreasonable to expect that a single behavioural item will yield high predictive accuracy of one's general disposition. Similarly, it is just as erroneous to assume that a single item on a test will generalize accurately to overall performance (Epstein & O'Brien, 1985). For purposes of illustration, it is worthwhile to briefly return to the Hartshorne and May (1928) study of honesty. Epstein first contends that besides the absence of an initial theoretical rationale for item inclusion as related to the construct of honesty, when re-analyzing the Hartshorne and May data based on the aggregation of individual behavioural items, the

average inter-item correlation of .23 actually increases to .73 (Epstein, 1980). Epstein expounds similar criticisms of the remaining studies cited in support of the situationist position (e.g., Dudycha, 1936; Mischel & Peake, 1982, etc.). In each case, consistency is established if and only if individual behavioural items are aggregated into a single index, purported to reflect a personality trait or disposition (for a complete review, refer to Epstein & O'Brien, 1985). In addition to item aggregation, Epstein also discusses the possibility of aggregating over situations and occasions. Through this process, one is in fact minimizing the variance attributed to the uniqueness of each situation in order to yield a composite measure of one's manifestation of a given trait.

Epstein (1979) hypothesized that stability coefficients are progressively enhanced as behaviours are aggregated over an increasing number of occurrences. For several days, he collected measures of emotions, impulses, and behaviours across a variety of situations, ranging from pleasant (e.g., receiving a positive evaluation) to unpleasant (e.g., experiencing the loss of a loved one). While correlations measuring stability were low when observations were restricted to a single day, observations aggregated over a 4-day period yielded a mean stability coefficient of .50, and a 10-day aggregation period generated a mean stability coefficient of .75. Similar results held regardless of behavioural rating method (i.e., self-report, direct observation, peer ratings, etc.). Therefore, it is argued that while situational specificity may hold for single behavioural items, the process and outcome of aggregating behaviours over both items and occasions serves to provide evidence for the existence of globally expressed traits (Epstein & O'Brien, 1985).

Stability and Consistency in the Forensic Literature

Temporal stability: A requisite for linking serial offences.

In the absence of physical evidence or eyewitness accounts, the practice of linking crimes to a common offender hinges solely on behavioural information revealed through crime scene characteristics and location. In effect, the accuracy of linkage analysis is contingent upon the *temporal stability* of an offender's behaviour (Alison et al., 2002). Such behavioural stability is purportedly reflected in one's *modus operandi* (MO), which encompasses all behaviours requisite to the successful perpetration of a crime. Hazelwood and Warren (2003) define MO as the "behaviours initiated by the offender to procure a victim and complete the criminal acts without being identified or apprehended" (p. 588). Thus, in a homicide case, MO may include victim choice, type of weapon used, type/severity of violence, and the like.

Considering that it forms the basis of linkage analysis, it is curious that the concept of *modus operandi* has been subject to limited empirical investigation (Bennell & Jones, 2005). Historically, the MO concept has been associated with the assumption that a given offender will exhibit similar behaviours across his crimes and, furthermore, that these behaviours will be relatively distinct from those of other offenders committing similar types of crimes (Green, Booth, & Biderman, 1976). Anecdotally, certain investigators, including law enforcement officers, have argued that one's MO is malleable, largely governed by acquired experience and gained confidence across a crime series (Douglas & Munn, 1992). However, others contend that while certain aspects of one's MO may be subject to situational influence, an offender's crime scene actions will be, in large part, temporally stable (Hazelwood & Warren, 2003). For

example, while the extent of force used by the perpetrator may be modified by the victim's degree of resistance, the offender's murder weapon of choice (e.g., knife versus revolver) is more likely to remain constant if it has produced desirable results in the past. In accord with learning theory, Hazelwood and Warren argue that as long as certain offence behaviours have consistently produced desired consequences (e.g., successful commission of the crime) and have not resulted in unwanted outcomes (e.g., apprehension by authorities), they are likely to be observed in future crimes committed by the same perpetrator.

In reference to the debate on offender stability in serial homicide specifically, certain researchers have introduced the distinction between *modus operandi* and *signature* (Douglas & Munn, 1992; Hazelwood & Warren, 2003). MO is said to encompass only those behaviours requisite to the physical perpetration of the crime (e.g., weapon selection, use of vehicle to transport body, etc.). Signature, in contrast, is defined as a ritualistic component of the crime emanating from an offender's internal pathological fantasy. It has been referred to as a perpetrator's "behavioural calling card" or "psychological imprint", which has no functional value in itself but provides the offender with intrinsic gratification (e.g., posing the victim's body, writing on the victim, etc.). It is argued that, being fantasy-based, the signature aspect of a crime is more stable and enduring relative to MO (Douglas & Munn, 1992). Despite the theoretical reliability of using signature as an investigative aid, the line between signature and MO is often ambiguous. For example, if strangulation of the victim is the ultimate cause of death, this behaviour is rendered necessary to the perpetration of the crime. However, the offender may also derive particular psychological satisfaction from

performing the act of strangulation, thus serving to fuel his fantasy. Due to potential confusion, most researchers in the area of serial homicide either employ *modus operandi* as an umbrella term or implicitly group both concepts into the general study of crime scene behaviour (Hazelwood & Warren, 2003; Hodge, in press; Salfati & Bateman, 2005).

Although limited, the empirical evidence in the forensic domain does appear to confirm the temporal stability assumption, thus supporting the foundations of linkage analysis. In an early attempt to move from intuition and anecdotal evidence to a systematic analysis of MO stability, Green et al. (1976) set out to investigate the assumption that perpetrators of residential burglaries have preferred targets and specific MOs. The authors sampled 15 burglaries committed in Chattanooga, TN. These cases were cleared and known to have been the work of three different burglars. The authors developed a typologically-based linking technique, with a measure of similarity based upon the proportion of shared features of a given crime pair. Similarity scores were assigned for seven different categories: location of entry, side of entry, location on block, method of opening, day of week, property value, and type of material stolen. For every crime pair, each category was assigned a score of 0 (non-shared characteristic) or 1 (shared characteristic). Therefore, the final measure of similarity between a given crime pair could potentially range from 0 (no common features) to 14 (all features in common). These similarity scores were then entered into a non-metric multidimensional scaling program, in which each crime was represented as a point in a two-dimensional space, with the distance between pairs of points being inversely related to the degree of similarity between a given crime pair. Green and colleagues found a 93%

correspondence between actual crime data and statistically defined groups. Thus, they were able to accurately assign 14 out of 15 cases of burglary to the corresponding serial offenders based on the premise of a stable *modus operandi*.

In a more recent investigation, Bennell and Canter (2002) endeavoured to empirically test the use of certain aspects of *modus operandi* to link property crimes perpetrated by the same offender. Their sample consisted of 86 randomly selected commercial burglaries, two committed by each of 43 serial offenders from a large metropolitan area in the United Kingdom. Bennell and Canter found that certain behaviours, namely the selection of crime site locations, was a particularly stable aspect of one's *modus operandi*, yielding predictive accuracy rates of approximately 80%. This research also demonstrated that increases in predictive accuracy are attained when combinations of linking features are considered as opposed to single behaviours.

Note that both the study by Bennell and Canter (2002) and that of Green et al. (1976) pertain to property crimes, while the current thesis involves interpersonal crime (i.e., homicide). Intuitively, the behaviour of a property crime offender may appear to be less contingent upon situational factors due to the victimless nature of the crime (e.g., no potential for victim resistance), and thus be expected to demonstrate more stability than that of an interpersonal offender. However, it has been argued that the behaviour exhibited by perpetrators of interpersonal crimes such as rape and homicide is highly grounded in deviant fantasy (Davies, 1992; Groth, Burgess, & Holmstrom, 1977; Hazelwood, Ressler, Depue, & Douglas, 1995; Hickey, 2002; Ressler et al., 1986). It is further reasoned by some that individuals who repeatedly fantasize about imagined or real encounters, criminal or otherwise, are likely to perform behavioural sequences

guided by schemas (i.e., organized bodies of information stored in memory) and personal scripts (i.e., organized knowledge of a particular situation and the manner in which events in that situation are to unfold) (Davies, 1992). Therefore, in contrast to property offenders, a serial murderer whose actions are largely contingent upon a personal script is likely to become highly stylised and ritualistic in his criminal behaviour. It is thus highly probable that the latter will exhibit greater stability across his crime series. The three subsequently cited investigations pertain to the temporal stability of MO components in the context of interpersonal crimes specifically.

In an effort to investigate the stability of behaviour in serial rape, Hazelwood, Reboussin and Warren (1989) assessed a sample of 41 male incarcerated offenders across 12 American states. Subjects were all considered prolific rapists, having each committed a minimum of 10 sexual offences of this type and collectively responsible for 837 rapes. Data was collected through extensive interviews with each participant, conducted by staff employed at the FBI's National Center for the Analysis of Violent Crime (NCAVC). Collateral materials were also examined, including victim statements, police reports, prison records, and medical/psychiatric evaluations. Due to the elevated number of sexual assaults in the total sample, data collection was limited to the first, middle, and last offences committed by each subject (i.e., 123 assaults). Measures of stability were considered for several variables, including amount of force employed, pleasure experienced during the assault, victim injury, and assault duration. Overall, none of these variables demonstrated a significant degree of change across respective series of offences, suggesting that MO characteristics tend to remain stable from one offence to another. Moreover, degree of force employed by the offender was not related

to victim resistance, thus reinforcing the idea that offence behaviours exhibited in the context of interpersonal crimes are "brought to the scene by the [offender]", rather than arising as a product of victim precipitation (Hazelwood et al., 1989, p. 75).

Grubin, Kelly, and Brunsdon (2001) similarly examined the degree to which serial sex offences are characterized by behavioural stability. They extracted a sample of 468 serious sex offences from a UK database, consisting predominantly of solved stranger rape cases perpetrated by a male against a female. Grubin and colleagues initially categorized offence behaviours into four domains, each representing a distinct and salient aspect of a sexual attack (i.e., control, sex, escape, and style). Through the statistical method of cluster analysis, each of the domains was further divided into four subtypes according to the specific manner in which behaviours within that domain tended to be associated (e.g., Control Type 1, 2, 3 and 4). Subsequently, each crime contained in the database was assigned a four-part code, representing its position on each of the four behavioural domains (e.g., Control Type 1, Sex Type 2, Escape Type 4, Style Type 3). In order to test the assumption of behavioural stability within each domain, offences perpetrated by a common offender were grouped together. As hypothesized, a significantly greater level of temporal stability was evident across a crime series than would be expected by chance. Indeed, Grubin and colleagues found that 83% of offenders were consistent (i.e., demonstrated identical behavioural sequences) in at least one of the four domains across respective crime series. Furthermore, results suggested that offenders exhibited the greatest degree of stability within the "control" domain (e.g., use of weapon, site of attack, type of attack, etc.),

with identical domain types evident in nearly 70% of consecutive offences committed by the same individual.

A recent study compared the pre- and post-release offence behaviours of 1,300 male sexual offenders (Sjostedt, Langstrom, Sturidsson, & Grann, 2004). For the purposes of the investigation, a sub-selection of MO components was considered, including information related to victim choice (e.g., male versus female) and nature/severity of the offence (e.g., death threat). Data on sexual offence behaviour committed prior to conviction was obtained retrospectively by consulting prison files and police reports. Recidivistic behaviour was determined through court reports after a mean post-release follow-up period of six years. Of the subjects reconvicted of a sexual offence, MO characteristics demonstrated a high degree of temporal stability, specifically with respect to victim preference (average Kappa values ranging from .51 to .79). However, type and severity of offence behaviours only yielded low to moderate levels of stability (average Kappa values generally ranging from .30 to .40). It could be argued that the period of incarceration between assessments, during which time offenders were likely provided treatment and subjected to new contextual influences, resulted in a significant underestimate of the stability typically observed in offence behaviour. Thus, it is reasonable to assume that had the researchers limited their sample to pre-conviction (or post-release) offences, the stability of behavioural measures would have demonstrated a marked elevation.

Cross-situational consistency: A requisite for criminal profiling.

The use of criminal profiling as an investigative tool is based on the premise that an individual's traits are cross-situationally consistent. In other words, it is assumed that

dominant behavioural themes emerging from an offender's crime scene actions will mirror the themes he exhibits more generally, in a context removed from that of a particular offence or crime series. As in the personality literature, results stemming from the forensic domain are generally not supportive of the cross-situational consistency assumption. As evidenced by the subsequently cited profiling literature, only 'pockets' of local consistency tend to emerge, whereby a specific action is related to a specific offender characteristic. However, such findings are quite meagre in contrast to the more practically useful yet unsubstantiated assumptions governing multivariate prediction (Alison et al., 2002) – i.e., thematic clusters of behaviours in the criminal domain empirically linked to a particular set of background characteristics.

In a study related to cross-situational consistency, Davies, Wittebrood and Jackson (1998) attempted to infer the nature of a sexual offender's prior criminal record on the basis of specific non-sexual aspects of his crime scene behaviour. It is generally reported that 85% of stranger rapists hold criminal records for an array of crime-types, of which sexual offences form only a subset (Jackson, Van den Eshof, & Dekleuver, 1993). Therefore, Davies and colleagues suggested that the display of a high degree of aggression during the commission of a sexual assault might be indicative of a general tendency towards aggression, potentially demonstrated through prior convictions for violent crime.

Through records extracted from 33 British police forces, the authors obtained a sample of 210 sexual offenders and gathered data on both index offence (i.e., the sexual assault in question) and prior criminal convictions. Crime scene variables related to the index offence were dichotomously coded for occurrence or non-occurrence, and

included attempts on the part of the offender to conceal his identity (e.g., use of gloves, semen destruction), the perpetrator's method of approach (e.g., confidence approach, blitz attack), and so forth. Offender characteristics of interest essentially consisted of the content and extent of one's prior criminal record.

Results obtained through logistic regression revealed that offenders who engaged in forced entry and stole from the victim in the context of the index offence were, respectively, four and five times more likely to have prior criminal convictions for property offences than those who did not exhibit such behaviours. Furthermore, the manifestation of extreme violence defined by striking the victim twice or more during the rape, indicated that the offender was three times more likely to have a prior conviction for a violent offence than those who did not display this degree of aggression. Hence, certain significant relationships were observed between particular crime scene actions and particular background characteristics. However, in a follow-up analysis, use of crime scene actions as predictors of criminal background within logistic regression models failed to yield improvement over the information obtained through simple base rates.

Similarly, House (1997) attempted to elucidate the relationship between crime scene behaviours and criminal antecedents. Based on a sample of 50 male rapists, 39 predetermined crime scene actions were dichotomously coded for presence or absence via the consultation of police records. Within the criminal context of rape, underlying behavioural themes were identified on the basis of co-occurring crime scene actions. The thematic clusters distinguished were aggression (e.g., physical and verbal violence), criminality (e.g., overt criminal acts indicative of attempts to conceal identity and avoid

apprehension), pseudo-intimacy (e.g., distorted attempts to establish relationship with victim through compliments, etc.), and sadism (e.g., torture, humiliation). Compared to other themes, the manifestation of 'criminality' was associated with the highest likelihood of previous incarceration (88.9%). However, irrespective of crime-related behaviour, offenders in the sample were generally homogenous with respect to their criminal antecedents. For instance, regarding previous imprisonment, sex offenders displaying one of the remaining three themes also demonstrated high rates of previous incarceration, ranging from 76-79%. Similar findings emerged across the other various background characteristics examined.

In an endeavour to test the cross-situational consistency assumption, Mokros and Alison (2002) assessed the relationship between thematic clusters of crime-related actions and subsets of an offender's background characteristics. Based on a sample of 100 stranger rapists, information pertaining to crime scene actions (e.g., surprise attack, theft of personal property) was extracted from victim statements, while background characteristics (e.g., education, marital status, criminal history) were obtained from police records. All variables were rated dichotomously as present or absent, after which inter-correlations between 28 offence behaviours were subject to multivariate analysis to identify whether given rape behaviours would correlate with various offender background characteristics. Discouragingly, no significant linear relationships were observed between crime scene behaviours and variable clusters related to offender demographics or criminal background. In other words, cross-situational consistency failed to emerge across these domains.

Arguably one of the more promising studies to emerge from the profiling literature, Canter and Fritzon (1998) analyzed 175 solved cases of arson transpiring in the United Kingdom. On this basis, they identified four distinct motivationally-based styles of arson, with which they subsequently attempted to link specific offender background characteristics. Through multivariate statistical techniques, it was found that arson types were significantly correlated with particular scales of perpetrator background characteristics. For instance, Canter and Fritzon identified a form of arson termed 'instrumental-object', in which the offence is largely opportunistic and typically marked by illegal entry and theft. Results indicated that perpetrators of this particular style of arson tend to be young offenders that have previously come to the attention of the criminal justice system. In contrast, a form of arson labelled 'expressive-person' is internally motivated from a pathological desire to seek attention and/or alleviate emotional distress, and may involve setting fire to oneself or one's own home. It was found that this type of arsonist is generally female and has a history of psychiatric disorders and previous suicide attempts.

Applying Previous Research on Stability and Consistency to Serial Homicide

In the present thesis, issues of temporal stability and cross-situational consistency will be applied to serial homicide, these concepts having yet to be examined in relation to this particular crime. In many regards, the emergence of consistency and stability is arguably more probable in the context of homicide as opposed to more commonly studied offences such as rape and burglary. As stated previously, interpersonal offenders tend to be heavily guided by personal scripts and therefore, in contrast to property offenders, they are more apt to exhibit a stable configuration of

behaviours across their crime series (Davies, 1992). In addition, it could be argued that serial homicide is the 'ultimate' interpersonal crime. Compared to other crime types, serial homicide offenders are likely to exhibit the greatest degree of psychotic fantasy (Holmes & Holmes, 1998). Therefore, this population is more conducive to the study of certain moderator variables that have emerged in the personality literature with respect to consistency/stability – i.e., respondents versus operants (Funder & Colvin, 1991) and 'disorganized' personalities (Alker, 1972).

Serial homicide: Definitions and prevalence rates.

Serial homicide is typically defined as the sequential killing of three or more human victims over a period of time, with an emotional "cooling off" period (i.e., days, weeks, or months) present between each event (Holmes & DeBurger, 1988). While the majority of homicide offences are extrinsically motivated by a variety of factors running the gamut of monetary gain, revenge, and direct victim precipitation, serial homicide cases are etiologically and motivationally distinct (Holmes & Holmes, 1998). Serial murderers are typically prompted to commit their crimes via internal motivational forces that govern and direct their homicidal behaviour. Furthermore, while generally premeditated (Rossmo, 2000), the serialist's crimes involve multiple slayings of individuals usually unknown to him or with whom only a brief encounter has transpired (Holmes & Holmes, 1998).

For 2003, Statistics Canada reported a total of 548 recorded murders, or 1.73 for every 100,000 inhabitants. However, the majority of these consist of single offences committed against intimates. From a relative standpoint, serial homicide is statistically rare (Rossmo, 2000; Silverman & Kennedy, 1993). However, as argued by Rossmo

(2000), the psychological impact of serial murder upon communities is particularly fear-inducing. Holmes and Holmes (1998) calculate that approximately 5,000 cases of serial homicide are reported annually in the United States, committed by an estimated 350 serial offenders (average of 14 victims per offender). Hickey (2002) thoroughly reviewed solved homicide cases transpiring between 1800 and 1995. His data suggests that during this period, approximately 400 serial murderers were responsible for claiming 3,200 victims (average of 8 victims per offender). While Canadian estimates are officially unavailable, Rossmo (personal communication, October, 2004) conservatively estimates that at any given time, there are approximately five to ten active serial killers in Canada, collectively claiming up to 50 victims per year. As evident by these numerical discrepancies, prevalence rates of serial homicide are particularly difficult to accurately estimate due not only to problems directly related to linking serial offences, but also to the social and historical variations in law enforcement and recording practices. While inconsistencies are also apparent with respect to homicide trends, Rossmo (2000) estimates that over the past few decades, per capita serial murder rates have increased twofold.

Behavioural Classification System

Although serial murderers represent but a minuscule proportion of all homicide offenders, the former group tends to engender a high degree of public interest, both in the form of fear and fascination. The documented heterogeneity of serial murderers has led researchers to devise classification schemes in an effort to differentiate offenders based on motivation, causation, offender/victim interaction and crime scene actions (e.g., Holmes & DeBurger, 1988; Knight, Rosenberg, & Schneider, 1985; Rossmo,

2000). In addition to building upon theory and directing legal and clinical intervention, a further objective of constructing typologies is to guide investigative efforts (Hodge, in press; Knight, Prentky, & Cerce, 1994). In the context of the present research, the primary purpose of deriving behavioural themes of serial homicide is analogous to the personality psychologist's practice of defining core traits prone to exemplify stability and consistency. In other words, stability/consistency are more likely to be observed at the thematic level than at the individual item level (Epstein & O'Brien, 1985).

In contrast to motivationally driven typologies which are largely grounded in clinical opinion, Canter and Heritage (1990) elect the use of a more empirically testable, behaviourally based framework for investigative purposes that differentiates offenders based on configurations of crime scene actions. Naturalistic, behavioural observation is advantageous in that this form of measurement is unobtrusive, readily available to police officers, and is clearly more objective than clinical inference regarding offender motivation (Alison, Snook, & Stein, 2001). In the context of criminal linking/profiling, it is assumed that an offender's perception of himself, his victims, and his environment in general remain invariant, thus reflected in a stable/consistent style of interaction over time and across situations (Canter, 1994). Thus, the preliminary aim of this investigation is to identify these major modes of interaction existing between offenders and their victims such as to optimize the likelihood of finding stability/consistency. Therefore, it is postulated that the behavioural themes evident at a crime scene are also present in the offender's non-criminal life as revealed through specific background characteristics related to childhood/family experience, sexual history, psychiatric history, psychological traits, criminal history, and the like.

Canter's (1985) classification approach is grounded in facet theory and the delineation of behavioural themes is achieved through multidimensional scaling techniques. Although these statistical procedures will be discussed at length in the methodological section of the present thesis, the basic premise of this analytical approach is as follows. Crime scene variables (i.e., offender actions) are visually represented in a geometric space, whereby the frequency of co-occurrence between any two given actions is inversely proportional to the distance between the two corresponding points. In other words, the smaller the distance between two variables in space, the greater their frequency of co-occurrence. As shall be discussed in the forthcoming methodology, the thematic approach applied in the present thesis is advantageous in that it does not necessarily entail a mutually exclusive classification (Hodge, in press). In other words, more than one theme may be present in the actions/background characteristics of a single perpetrator, and his degree of expression of each theme may vary. Therefore, this particular approach allows for the identification of both qualitative and quantitative differences between offenders on various behavioural themes.

While an exhaustive review of proposed offender classification systems is beyond the scope of this thesis, the particular thematic distinction selected for the present research is borrowed from Canter, Bennell, Alison, and Reddy (2003), and therefore warrants further discussion. The classification scheme in question is a threefold distinction consisting of the behaviourally based themes of *hostility, control* and *involvement*. Empirical support for the emergence of these themes has been found in the study of serial rape (Canter, 1994; Canter et al., 2003; Canter & Heritage, 1990),

serial sexual homicide (Hodge, in press), and sexual offences committed against children (Bennell, Alison, Stein, Alison, & Canter, 2001). Since the vast majority of serial homicide offenders display forms of sexual predation in the context of their crimes, it is reasonable to suggest that the same threefold thematic distinction applies (Hodge, in press).

Hostility.

Hostility has been defined by Buss (1961) as a cognitive construct that is distinguished by an oppositional attitude towards others (or society in general) involving antagonism, ill will and denigration. Hostility is essentially viewed as the precursor to the action tendency of inflicting harm upon others through the manifestation of aggressive and vindictive behaviour (Smith, Glazer, Ruiz, & Gallo, 2004). To a perpetrator of homicide with strong proclivities towards a theme of hostility, the victim is perceived as a vehicle by which the offender unleashes his anger and aggression. Bartol (1986) suggests that the aggression exhibited by the offender encapsulates both the instrumental violence intended to kill, in addition to attempts to demean and humiliate the victim. The hostility theme within the criminal realm is generally characterized by a blitz attack and is typified by excessive brutality (i.e., overkill) and multiple forms of violence observed within the context of a single offence (e.g., stabbing, punching, kicking, etc.). The brute violence exhibited is frequently directed not only towards the victim, but also towards the victim's property through acts of ransacking and vandalism (Godwin, 2000). Moreover, the theme of hostility is often reflected in behaviours related to indirect aggression, such as the stealing of non-personal items (e.g., money) and forced entry into the victim's home (Holland, Levi, &

Beckett, 1983). Given the emotionally expressive quality of the murder, the configuration of offence behaviours from one crime to the next is apt to be erratic and highly malleable. In other words, the offender is likely to be receptive to victim responses and modify his script according to verbal supplications, degree of resistance, and so forth.

Behaviours representative of hostility within the non-criminal realm may include juvenile antisocial tendencies (e.g., firesetting, bullying, instigation of fights, truancy) (DSM-IV, 1994), potentially translating into a juvenile criminal record. In adulthood, hostility may be reflected in either a formal psychological diagnosis of Antisocial Personality Disorder (APD) or by specific behavioural manifestations characteristic of this diagnosis (e.g., criminal record for theft, physical assault, etc.). It has been demonstrated that those scoring high on measures of hostility are also more inclined than those scoring low on this construct to engage in domestic violence and various forms of substance abuse (Smith et al., 2004). A history of one or more suicide attempts is also a likely index of hostility, with research indicating a high co-morbidity rate between suicidal inclinations and antisocial conduct (Brent, Baugher, Bridge, Chen, & Chiappetta, 1999; Rich, Young, & Fowler, 1986). Finally, a relationship has also been established between hostility and promiscuity, as reflected in a history of numerous casual and indiscriminate sexual relationships (Christopher, Owens, & Stecker, 1993).

Control.

An individual with a high need for control tends to exemplify a strong desire for structure and predictability in both the physical and interpersonal realm (Burger & Cooper, 1979). This structure may be achieved through the selection of an already

regimented environment or through one's own manipulation. The behavioural theme of control as displayed by an offender in the context of serial homicide indicates that this individual views his victim with emotional detachment, as an object or 'prop' upon which he seeks to express complete dominance. Groth (1979) has described this offence style as an expression of complete power and domination over another human being, forcing the victim into a position of supplication and non-resistance. Thus, typical actions performed by the perpetrator may include overt attempts to control and immobilize the victim through the use of bindings and gags (Canter et al., 2003; Canter & Heritage, 1990; Hodge, in press). The highly ritualistic aspect of this theme is conveyed through a meticulously detailed script (Hodge, in press). The offender may perform actions indicative of preplanning, such as the use of a con approach, bringing a weapon/crime kit to the crime scene, disposing of the corpse, and so forth. There may also be attempts on the part of the offender to conceal his identity through the destruction of forensic evidence (e.g., semen, fingerprints). Hodge (in press) argues that although the victim plays an important role in the murder as a passive entity, the offender is unlikely to respond to the victim's behaviour and is likely to maintain a fairly consistent script across offences.

Removed from the context of serial homicide (i.e., unrelated to the murder series in question), items potentially exemplified by an offender with a strong need for control might include the performance of distinct sexual behaviours, such as fetishistic practices and the frequent viewing of pornography. Indeed, a significant association has been established between deviant autoerotic practices and the tendency to scrupulously control aspects of one's life as exemplified through overachievement in

academic/vocational settings and meticulous detail accorded to one's appearance (Holmes & Holmes, 2002). Moreover, in the case of both pornography and fetishism, the individual is substituting a person for an object, which, in essence, diminishes the degree of personal interaction that the offender would otherwise establish with a partner. Ultimately, these behaviours increase his level of control over situational variables. In addition, the theme of control is highly related to a preference for sadistic sexual behavior in which one's partner is rendered submissive through the use of handcuffs, whips, chains, etc. (Breslow, 1987; Marshall & Firestone, 1999). In terms of occupational endeavours, individuals with a strong desire for control are likely to be found in supervisory-type roles and/or employed in highly structured work environments that potentially require a degree of post-secondary education or training (e.g., managerial position, military officer, etc.) (Barber, 1990).

Involvement.

The behavioural theme of involvement is employed as an umbrella term, reflecting an individual's need for both affiliation and intimacy. A need for affiliation is defined as the desire to establish interpersonal or social connections, while the closely related need for intimacy is represented by one's quest to forge a meaningful and communicative relationship with another person (Taradash, Connolly, Pepler, Craig, & Costa, 2001). Thus, a homicide offender displaying a theme of involvement conveys his perception of the victim as a person with whom his desire for interpersonal interaction is fulfilled. Marshall (1989) argues that this offender seeks to establish a deviant form of pseudo-intimacy with his prey and accordingly, treats her (or him) as a reactive individual.

The offender is likely to seek victim participation by requesting the performance of particular actions such as kissing, caressing, and/or specific sexual acts. Moreover, pre-mortem behaviours of a sexual nature tend to be more conventional, plausibly mimicking those performed in the context of a genuine romantic relationship (e.g., vaginal penetration, oral sex, etc.). However, deviant practices such as cannibalism are also typical of an offender seeking to establish "intimacy" with his victim. By consuming an individual's flesh and/or blood, the offender is literally making her (or him) part of his own body and has thus established the ultimate sense of physical connectedness (Nicolaidis & Nicolaidis, 1993). Due to his emotional attachment to the victim within the qualified constraints of the offence, the offender will be less excessive in his manifestation of violence. Furthermore, there may be an effort to obliterate the identity of the victim, either by attacking or covering the victim's face. Holmes & Holmes (2002) argue that such actions convey the offender's implicit awareness of the victim's innocence. Through a renouncement of the victim's identity, the offender neutralizes the "shame" inherent in the paradoxical act of destroying an innocent person (Salfati & Canter, 1999). Furthermore, the offender may redress the body following the attack and strive to prolong the relationship by stealing items of personal value to the victim (e.g., an item of clothing, a photograph). In the same vein, the offender is likely to document the crime by maintaining a diary or by videotaping/photographing the victim during the offence such that he is able to relive the interaction and feed his deviant fantasy. Notably, it has been suggested that because the victim is perceived as an active participant, the offender is attuned to this individual's responses. Therefore, he is

likely to modify his script accordingly and tailor his behaviour to suit each individual crime (Hodge, in press).

In the non-criminal domain, behavioural indices of a strong need for involvement may include participation in a number of social clubs (e.g., sports teams, chess clubs, acting troupes, etc.), as well as membership to a particular religious community (Sokolowski, Schmalt, Langens, & Puca, 2000). In a more aberrant form, attempts to establish pseudo-intimacy may be evidenced through certain paraphilias, namely voyeurism and pedophilia (Holmes & Holmes, 2002). Although manifested as deviant acts, these behaviours respectively indicate a desire on the part of the offender to establish an intimate relationship with another (perhaps non-threatening) individual or demonstrate the offender's yearning to participate in an intimate relationship.

Current Study

Summary of the literature.

From a theoretical standpoint, the present research will serve to address validity issues with respect to the core assumptions of linkage analysis and criminal profiling. As discussed, temporal stability is a prerequisite to the practice of accurately linking serial crimes. Cross-situational consistency, on the other hand, is a necessary assumption for criminal profiling as it involves establishing a general (i.e., non-criminal) template of a potential suspect from his behaviour in the criminal domain. As a prerequisite to linking serial offences, the temporal stability of traits is generally supported in both the forensic and personality domains (e.g., Bennell & Canter, 2002; Epstein, 1979). Contrarily, there appears to be little evidence for cross-situational consistency of behaviour or traits – the

very assumption behind criminal profiling (e.g., Alison et al., 2002; Mischel, 1973, 1999).

Strengths and limitations of investigative data.

It is important to note that, while the field of investigative psychology implicitly grounds its methods in personality-based constructs, it fails to operationalize and measure these concepts as per the conventions adopted in the personality literature. Namely for practical considerations, research conducted in the forensic arena defines and measures stability/consistency in absolute terms (e.g., Grubin et al., 2001). This stands in contrast to the intended definitions and general conceptualization of these terms as relative measures by personality psychologists (Cervone & Shoda, 1999). The absolute standard of measurement adopted by investigative psychologists conceivably underestimates true levels of consistency and stability in offender populations from those that would be obtained were these terms operationalized as intended in the personality literature. Therefore, the particular methodology proposed in the present thesis is novel in its attempt to elucidate personality based concepts and related definitions as they pertain to criminal behaviour. Furthermore, should the present study fail to yield evidence of consistency and stability as relative measures, it is highly unlikely that these would be observed when defined in absolute terms.

Although attempts will be made to replicate personality based methods and definitions from which the concepts of consistency and stability are grounded, certain limitations and logistical constraints exist. Personality researchers typically conduct experimental studies in which there is considerable control over situational variables. The nature of the present data (e.g., archival data on serial homicide offenders) severely

limits knowledge of situational variables and precludes the possibility of experimental manipulations. Although investigative/archival data is advantageous by the fact that it is unobtrusive and immune to researcher and participant biases, investigators and police officers are simply passive observers, playing no role in structuring the research situation. As a result, while an effort will be made to examine offenders' degree of stability and consistency from a personality perspective, exact methodological replications (i.e., proportioning of variance, etc.) are unfeasible. It bears mentioning that given the nature of investigative data in which situational parameters are difficult to clearly define, the tests of stability and consistency will be conservative in nature and any significant findings will be achieved in spite of the data.

Hypotheses.

1. *Behavioural items stemming from both the criminal and non-criminal domains, respectively, are expected to form a threefold thematic structure consisting of the facet elements of control, hostility, and involvement* (Canter, 1994; Canter et al., 2003; Canter & Heritage, 1990). Each element is expected to yield a cluster of conceptually related items that consistently co-occur. Summarized for convenience in Table 1 is a list of behaviours (contained within the available data set) predicted to fall under each theme across both the criminal and non-criminal domain, respectively.

Table 1

Predicted Behavioural Theme of Items in both the Criminal and Non-Criminal Domain

Hostility		Control		Involvement	
Criminal	Non-Criminal	Criminal	Non-Criminal	Criminal	Non-Criminal
- Blitz attack - Fist or club - Manual attack - Stabbing - Multiple violence - Forced entry - Ransacking - Destruction of property - Stealing (non-personal items) - Pre-mortem injuries - Bludgeoning - Multiple weapons - Posing	- Psychiatric history - Alcohol/drug treatment - Suicide attempts - Juvenile record - Domestic abuse - Burglary - Violent offences - Drug offences - Unemployed - Parole - Divorced - Multiple marriages	- Con - Gag - Ruse - Destruction of evidence - Body hidden - Body moved - Body buried - Captive - Bound - Weapon pre-selected & brought by offender - Restraints brought by offender - Crime kit - Torture - Post-mortem dismemberment - Post-mortem sex - Night entry	- Fetishism - Pornography - Military - Post-secondary education - Fraud	- Face covered - Cannibalism - Redress - Oral sex to victim - Oral sex to offender - Photo - Diary - Address book - Body found in offender's home	- Church member - Sports involvement - Voyeurism - Pedophilia

Note: Complete definitions of the above items are provided in Appendices A and B.

2. Given the empirical evidence for temporal stability stemming from both the personality (e.g., Olweus, 1979) and forensic bodies of literature (e.g., Hazelwood & Warren, 2003), it is expected that in the present study, *an offender will generally be temporally stable across his crime series.*
3. However, considering that the cross-situational consistency assumption has been repeatedly disputed in both the personality (e.g., Mischel & Peake, 1982) and forensic literature (e.g., Alison et al., 2002), it is expected that the manifestation of *behavioural themes across the criminal and non-criminal domains will generally exhibit low levels of consistency* due to the large disparity in contextual factors.

4. As suggested by research on moderator variables (e.g., Davies, 1992; Funder & Colvin, 1991), the *degree of both temporal stability and cross-situational consistency of behavioural themes is expected to vary as a function the nature of the behavioural theme itself.* In general, higher levels of stability/consistency are predicted to emerge in the control theme relative to the themes of involvement and hostility, due to the more highly scripted nature of the former theme and the lower dependence of its composite behaviours upon situational variables. In contrast, relatively lower degrees of stability/consistency are expected of involvement-related behaviours due to the integral role of the victim (and others members of the offender's social network) in this theme. Similarly, due to the frenzied and volatile nature of hostile offence behaviours, this theme is hypothesized to yield the lowest levels of stability and consistency.
5. *An amplification of these trends is predicted of dominant offender types.* For example, an offender predominantly displaying behaviours from the control theme across his crime series is expected to demonstrate higher degrees of consistency and stability across all themes relative to other dominant types. In contrast, relatively lower degrees of temporal stability and cross-situational consistency are expected to characterize offenders illustrating a dominant involvement theme and in particular, those primarily displaying hostility-related behaviours.

6. Finally, *behavioural stability/consistency is hypothesized to increase as a function of situational aggregation in the criminal domain* (i.e., aggregation of crimes in a series)[5] (Alison et al., 2002; Epstein, 1979).

Methodology

Archived Homicide Data

The sample considered in the present thesis is a subset of a larger sample of 96 serial homicide offenders initially compiled by Godwin (1998) for the purpose of his doctoral dissertation. Approximately 75% of this original sample was extracted from the Homicide Investigation Tracking System (HITS) database housed within the Attorney General's Office in Seattle, Washington. HITS was created by Keppel and Weis (1993) to facilitate the uniform collection of crime information and assist in the investigation of serial crimes (i.e., homicide, rape, kidnapping, etc.) occurring across police jurisdictions. In its initial stages of development, HITS investigators compiled data by contacting Washington's Department of Vital Statistics, in addition to 273 in-state police departments, coroners, medical examiners, and courts. The database was subsequently expanded to include information from additional police jurisdictions across the Pacific Northwest and is currently linked to law enforcement agencies across the United States and Canada (Godwin, 1998). At present, data on over 6,400 murders and 7,200 sexual assaults are maintained on both solved and unsolved cases (Office of the Attorney General, 2005). The HITS database includes salient variables related to crime scene characteristics, offender and victim features, and geographic locations, all of which are preserved chronologically.

[5] It could be argued that behaviours in the non-criminal domain are implicitly aggregated. For instance, a general index of an offender's relationship history is presumably a cumulative measure of occasions of past involvement in intimate relationships.

In addition to extracting information from the HITS database, Godwin (1998) was permitted to review private files on specific serial murder cases at the Department of Corrections in Washington. He supplemented the information obtained from HITS with data acquired from alternative homicide databases, including VICAP (Violent Criminal Apprehension Program) and HALT (Homicide Assessment and Lead Tracking System). In addition, court transcripts were consulted through American on-line databases, namely LEXUS and WEST LAW.

General issues of reliability.

All crime scene actions and background variables were coded dichotomously on the basis of whether a specific behaviour was present "1" or absent "0" in a given crime (Godwin, 1998). Considering that the initial coding was performed by crime analysts directly from police records, no measures of inter-reliability have been calculated on this data. However, there are general indications suggesting that the reliability of such data sets is indeed acceptable. With respect to reliability in general, it has been found that dichotomous decision-making in content analysis has the capacity to increase inter-rater reliability from 60% to 90% (Holsti, 1969; Krippendorff, 1980). It offers several advantages over alternative forms of decision-making by permitting the coder to focus on rendering one simple decision at a time while reviewing the decisional criteria at each step. Moreover, reports of inter-rater reliability associated with similar data sets (i.e., investigative/police data on sexual crimes against children) have yielded values as high as .98 (Kirby, 1993). Admittedly, this figure likely overestimates the inter-rater reliability of the current data set, in which the victim is no longer available to corroborate case facts. Nonetheless, for each case of serial homicide included in the

sample, Godwin (1998) established contact with the primary investigating officer and pertinent legal authorities in order to substantiate case facts and resolve any discrepancies. Included in the final data set are only those cases for which there was consistent information.

Current Sample and Included Variables

A sample of 59 serial homicide offenders was retained for analysis in the current thesis. Several exclusion criteria were established in order to control for potential confounds. First, female serial killers were omitted. Women represent the minority of homicide perpetrators and reportedly differ significantly from their male counterparts with respect to both *modus operandi* and potential motivation (Holmes & Holmes, 1998). Second, offenders operating in pairs or teams were excluded given that associated crime scenes would likely reflect characteristics of the dominant group member. Finally, offenders for which variables were missing in the original data set were also excluded. The multidimensional scaling software used to perform portions of the analysis (e.g., POSA/LSA) does not process cases containing missing data. Moreover, the non-random distribution of missing data precluded the use of methods traditionally employed to fill in values (e.g., data imputation through multiple regression, etc.) (Tabachnick & Fidell, 1989). Thus, the omission of cases comprising missing data at the onset of the analysis was considered a proactive measure.

A cap of three homicides per offender (i.e., the first three offences identified in the series) was established in order to maximize the sample size, while maintaining an equal number of crimes across subjects. Preserving an equal distribution of crimes across offenders allows one to guard against potential biases introduced by assigning

undue weight to highly prolific offenders who may exhibit unusually high or low levels of behavioural stability. Thus, a total of 177 crimes were considered in the primary analysis. In order to study the effects of compounding levels of aggregation, a sub-sample of 32 offenders, having committed (at least) 6 crimes each, was selected from the sample of 59 offenders.

From the pool of 109 variables coded by Godwin (1998), 62 were retained for analysis (40 crime scene behaviours and 22 background characteristics) based on their predicted membership to either the theme of hostility, control, or involvement (see Table 1). Hypothesized theme aside, variable omissions were generally based on several factors. Many behaviours in the data file were highly specific, therefore occurring with a frequency of less than one percent. For example, a series of variables in the data set pertained to the specific material used by the offender to bind his victim (e.g., bound with rope, bound with wire, bound with electrical cord, etc.). In such a case, variables were simply collapsed into one (e.g.,"bound"). If a low frequency variable (0-1%) could not be collapsed, it was simply omitted due its unlikely co-occurrence with any other item and consequent inability to contribute to thematic differentiation. Moreover, several variables in the crime scene file were specifically related to the victim's point of fatal encounter and the nature/location of the body disposal site. These items were also discarded as the focus in the present research is specifically on crime scene actions related to the criminal domain – not on crime-related geography.

Analysis

Overview of statistical procedures.

This particular section begins with a brief, rudimentary overview of each statistical procedure applied in the current thesis. Each analytical step will subsequently be discussed in further detail as it relates specifically to the present research.

For the criminal and non-criminal domains, respectively, behaviours were subjected to a multivariate statistical procedure termed *proximity scaling* (PROXCAL; Commandeur & Heiser, 1993) in an attempt to yield the hypothesized thematic structures (i.e., hostility, control, involvement). Once themes were delineated, an additional multivariate technique known as *partial order scalogram analysis* (POSA; Shye, 1985) was applied to the data. This statistical procedure allows for the identification of meaningful scales within each theme. An offender's quantitative scale ratings yielded from the POSA analysis on each theme across both criminal and non-criminal domains were then used to test the assumptions of temporal stability and cross-situational consistency. Again, the hypothesis is that behavioural stability will be observed while consistency will generally be violated.

POSA is an integral component in the analysis as it permits the quantitative (and qualitative) ordering of individuals and behaviours on a scale relevant to each theme. It was deemed necessary to apply this technique rather than simply consider behavioural frequencies as an index of one's degree of manifestation of a theme. The latter procedure would only be valid if the behaviours in a theme formed a homogenous construct unified by a common scale (Shye, 1978). Given the complexity of human behaviour, such is not likely the case (Bohm & Alison, 2001). Consider the very simple example of a

questionnaire included in a popular magazine that purports to measure one's degree of jealousy. It is often erroneously assumed that a higher score translates to a greater expression of jealousy in a purely quantitative sense. However, if the items of which this test is comprised do not form an underlying scale of jealousy, then scores based on the frequency of questions receiving an affirmative response are in fact not interpretable. For such scores to be meaningful, the magazine editors must first ensure that items included on the quiz do effectively form a quantitative scale of jealousy.

Proximity scaling (PROXSCAL).

A multi-dimensional scaling (MDS) technique known as *proximity scaling* (PROXCAL; Commandeur & Heiser, 1993) was applied to study the structural relationships among variables (see Table 1). Relatively free of distributional assumptions, PROXSCAL is a module included in SPSS that permits a spatial representation of the similarity and dissimilarity between non-metric data in a low-dimensional space (Meulman, Heiser, & SPSS, Inc., 1999). Thus, behavioural themes (analogous to traits as defined by personality psychologists) may be delineated as belonging to a particular domain (i.e., criminal domain and non-criminal domain). In other words, two separate PROXSCAL analyses were performed to produce 1) thematic clusters of co-occurring crime scene behaviours (i.e., criminal domain) and 2) relevant co-occurring background characteristics (i.e., non-criminal domain). For each analysis, the relationship between every variable pair is examined and illustrated in a geometric (visual) space.

The basic premise is that the greater the degree of association between two variables as represented by their frequency of co-occurrence, the closer their proximity

within the geometric space (Borg & Shye, 1995; Commandeur & Heiser, 1993). The PROXSCAL module essentially computes correlation coefficients between all variable pairs, thus creating a triangular correlation matrix. These correlations are then rank ordered, forming the basis of the spatial representation. The distances between variables in the geometric space produce a second or derived association matrix. The degree of fit between the original and derived matrices is dictated by the extent to which the rank orders between these two matrices are preserved. PROXSCAL produces a series of sequential iterations in such a manner as to provide the minimal number of spatial dimensions required for a geometric representation of good fit (i.e., the smallest number of dimensions that will permit the rank order of correlations to be preserved to the greatest degree) (Guttman & Greenbaum, 1998). For interpretational ease, a two-dimensional solution was specified for the present thesis.

The degree of fit between the two association matrices is given by the measure of *normalized raw stress*, which ranges from "0" (perfect fit) to "1" (complete lack of fit) (Kruskal & Wish, 1978). Customarily, a stress measure under .10 indicates a good degree of fit. However, this and similar standard stress measures may be influenced by several factors such as the number of variables included in the analysis, the theoretical strength of the framework, and the error associated with the data (Canter & Heritage, 1990; Shye, Elizur, & Hoffman, 1994). A second measure of fit frequently considered in proximity scaling is denoted as *Tucker's measure of congruence*, which ranges in value from -1.00 to 1.00. Typically, .95 or greater is said to indicate a good degree of fit (Meulman, Heiser, & SPSS, Inc., 1999).

Given the dichotomous nature of the data, the particular measure of correlation applied in the present analysis is the *Lance and Williams* measure (also known as the *Bray-Curtis* non-metric coefficient) (Santtila, Korpela, & Hakkanen, 2004). This index reflects the degree of association between variable pairs, omitting joint non-occurrences (i.e., the absence of two variables in a particular case does not increase the degree of association).[6] Given that police data is largely unverifiable (e.g., potential for unrecorded variables in police reports which were in fact present in the crime), Canter, Hughes, and Kirby (1998) argue that it is preferable to employ such conservative measures of association.

As previously mentioned, the interpretation of the resulting plot in terms of its variable structure is based on a research approach known as 'facet theory' (Canter, 1985). The term 'facet' is simply reflective of a set of variables related to a particular domain or concept (e.g., a set of behaviours related to serial homicide). Within each facet (i.e., criminal domain and non-criminal domain), the themes of *hostility*, *control*, and *involvement* were investigated empirically. The identification of structures inherent in the conglomeration of plotted variables is based on the *principle of contiguity*, which states that variables tied to a common construct or theme will be more highly correlated than those variables emerging from different constructs. Therefore, the former will be closer in proximity within the multidimensional space. Contrarily, variables appearing in different regions of the plot are considered dissimilar based on a low degree of co-occurrence and thus, belong to different behavioural themes (Canter & Heritage, 1990;

[6] The *Lance and Williams* coefficient is computed from a 2x2 contingency table as $(b+c)/(2a+b+c)$, where a represents the cell corresponding to cases in which both variables are present, and b and c represent the diagonal cells depicting cases in which one variable is present and the other is absent.

Shye, 1978). On this basis, it is then possible to delineate regions within the geometric space.

To partially circumvent the subjectivity inherent in partitioning the plot based solely on the face validity of variables, Kuder-Richardson 20 (K-R 20) coefficients were calculated on various combinations of adjacent variables. K-R 20 is an index of internal reliability, which tests the likelihood of variables in a particular region sharing a common theme (Anastasi, 1988). K-R 20 is essentially the equivalent of Cronbach's alpha, but the former is a measure specifically applied to dichotomous data. An attempt was made to partition variables in such a way as to maximize K-R 20s while respecting theoretically based predictions.

Partial order scalogram analysis (POSA).

As briefly discussed, once thematic regions were delineated within the geometric space, an additional multivariate technique known as Partial Order Scalogram Analysis (POSA; Shye, 1985) was applied to the data to permit the identification of meaningful scales within each behavioural theme. While proximity scaling focuses on identifying the structure of behaviours and seeks to maintain the similarity ranking of all behaviour pairs in the original correlation matrix, POSA focuses on individual cases (e.g., homicide offenders and crimes) and attempts to preserve order relations existing among their profiles on the variables in question. Note that the POSA software requires recoding of variables, such that "2" now signifies the presence of a particular item, while "1" signifies the absence thereof. A *profile* indicates the presence or absence of each behaviour exhibited by a particular offender. For example, as illustrated in Table 2, the profile for Larry is 2211, indicating that Larry engages in both profanity and the

utterance of death threats – but neither hitting nor stabbing. The basic units of analysis in POSA are these individual profiles illustrated within a data matrix, representing combinations of behaviours for each person (Guttman & Greenbaum, 1998).

Theoretically, a 'perfect' scale (also called a Guttman scale) consists of a set of profiles with an inherent cumulative order. Each profile in a Guttman scale is greater than the one preceding it, comprising all the items of the preceding profile plus one or more additional items (Borg & Shye, 1995). For example, if hostility were to form a perfect scale, each subject profile would reflect a higher degree of hostility than the one preceding it (see Table 2). For explanatory purposes, four hypothetical items have been selected from the behavioural theme of hostility: profanity, death threats, hitting, and stabbing. In this example, it can be stated that Curly (2221) exhibits a higher degree of hostility than Larry (2211) because Curly exhibits all the behaviours that Larry does, plus one additional item (i.e., hitting). When behaviours scale perfectly as in this hypothetical case, the items that form a particular theme/trait can be assessed on a unidimensional scale, whereby an individual's quantitative profile score is sufficient to convey all the behavioural information contained in one's empirically observed profile. Thus, given a quantitative profile score of "6" (obtained from adding the numerical indices corresponding to each behaviour in a particular row), and knowledge of the cumulative order of the scale, one is known to have engaged in profanity, death threats, and hitting – but not stabbing. Moreover, each successive behaviour conveys the expression of a greater degree of hostility than the previous, with profanity being lowest and stabbing highest (i.e., stabbing, in this case, necessarily entails the performance of all other behaviours).

Table 2

Example of Profiles Within the Theme of Hostility: The Formation of a Perfect Scale

Offender	Profanity	Death threats	Hitting	Stabbing	Quantitative profile score
Bill	1	1	1	1	4
John	2	1	1	1	5
Larry	2	2	1	1	6
Curly	2	2	2	1	7
Moe	2	2	2	2	8

In practice, adherence of constructs to a Guttman scale is rare, although approximations of Guttman scales have been evidenced in the stages of substance abuse in adolescence (Andrews, Hops, Ary, & Lichtenstein, 1991), as well as in the acquisition of certain child motor skills (Fox & Tipps, 1995). The development of POSA arose from the need for a more inclusive model, given that very few phenomena empirically conform to a 'perfect' or unidimensional scale (Guttman & Greenbaum, 1998). Indeed, POSA is *partially ordered* for the very reason that it does not assume that behavioural items under a given theme/trait will form a perfectly ordered scale. Given a substantive rationale for item inclusion under a particular theme, POSA assumes not only that individuals will differ in the degree to which a particular theme is manifested (i.e., quantity), but also in the types of behaviours manifested within that theme (i.e., quality).

In the present study, POSAs were performed separately for themes in the criminal and non-criminal domains. Thus, within each domain, three separate POSAs were conducted, one for each behavioural theme delineated within the PROXSCAL plot.

However, for illustrative purposes, the same four hostility behaviours specified above will be considered, as expressed in the context of serial homicide.

As before, profiles are generated for offenders based on the presence or absence of behavioural items across their respective crimes (see Table 3). These profiles are then plotted graphically in a POSA space, allowing for the comparison of each profile with every other profile on two axes. As shown in Figure 4, the Lateral axis (L-axis) runs from the top-left to the bottom-right of the POSA space, and reflects qualitative differences between profiles. The Joint axis (J-axis) extends from the bottom-left to the top-right of the geometric space and illustrates the quantitative degree of expression of a given behavioural theme – in this case, hostility. Offender profiles having the highest rank (highest degree of overall hostility as indicated by total quantitative profile score) occupy the northeast quadrant, while those having the lowest rank occupy the southwest quadrant (lowest degree of overall hostility). One's position along the J-axis is reported as a *J-score* – an index of a profile's quantitative rank related to the construct depicted by the plot. J-scores range from 0-200 and are equivalent to the sum the profile's x-axis and y-axis scores (Shye, Elizur, & Hoffman, 1994).

Table 3

Example of Profiles Within the Theme of Hostility Exhibiting Both Quantitative and Qualitative Differences

Offender	Profanity	Death threats	Hitting	Stabbing	Quantitative profile score
Ted	1	1	1	1	4
Jack	2	1	1	1	5
Jeffrey	2	2	1	1	6
Damien	2	1	2	1	6
Norman	1	1	2	2	6
Jason	2	2	2	1	7
Freddy	2	2	2	2	8

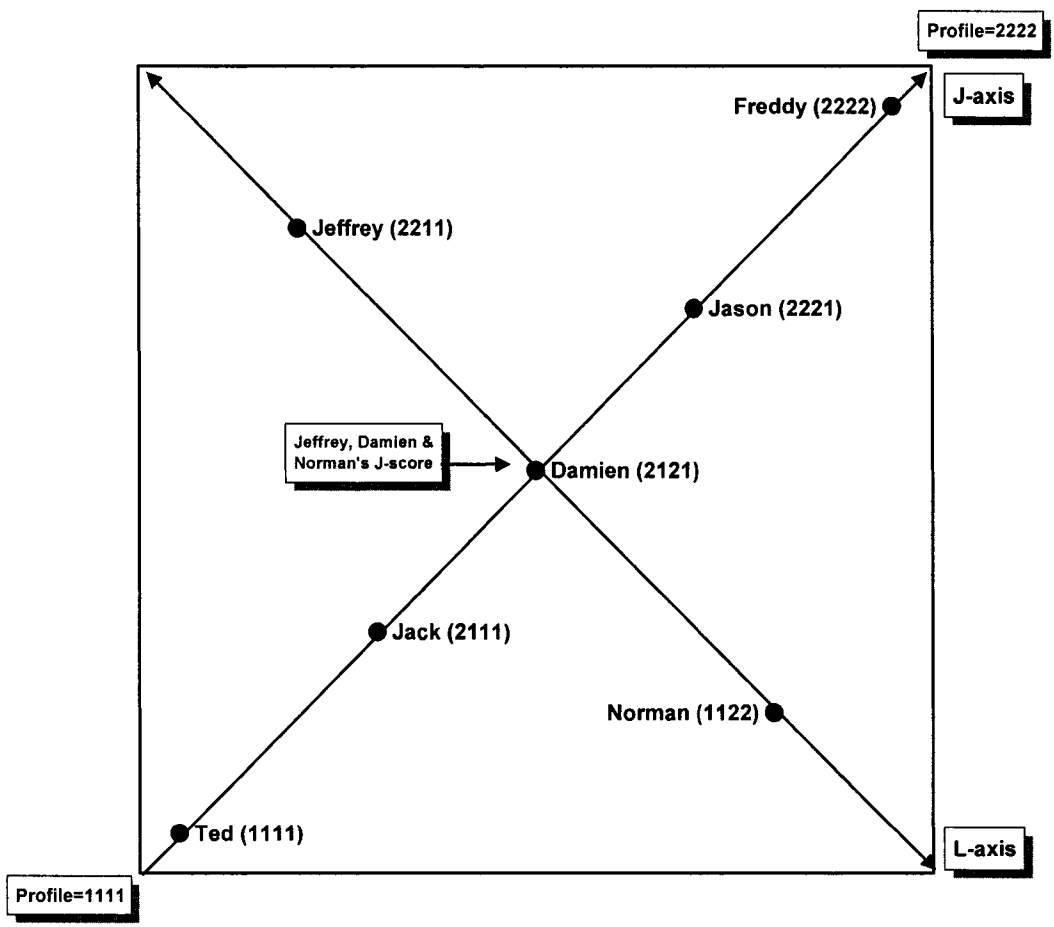


Figure 4. Sample POSA plot for hostility profiles.

Conceptually, it is the J-axis that represents profiles that are quantitatively comparable. In this example, Freddy has an overall profile score of "8". Clearly, this offender exhibits an overall higher degree of hostility than any other offender in this sample. Therefore, as observed in Figure 4, Freddy is situated at a higher position on the J-axis (and holds a higher J-score) than every other individual depicted on the plot. Jeffrey, Damien and Norman are quantitatively identical, each having a profile score of "6". Each of these offenders has expressed an equal number of hostility behaviours and therefore manifest equivalent degrees of hostility. However, they are qualitatively dissimilar as they engage in different hostility behaviours. Therefore, the three offender profiles will share the same Joint-axis score (J-score) and will be plotted at the same position along the J-axis. Nevertheless, they will be situated in different locations along the L-axis due to their qualitative dissimilarity. It could therefore be stated that Jeffrey, Damien, and Norman have incomparable profiles, potentially manifesting different forms of hostility. Indeed, the personality literature has examined the construct of hostility and has found that this trait can be subdivided into multiple scales consisting of verbal hostility (e.g., cursing), assault (e.g., physical violation of another), indirect hostility (e.g., door slamming), among others (Castillo, de Baca, Conforti, Qualls, & Fallon, 2002).

In order to clearly decipher the qualitative and quantitative differences between profiles, item plots must be constructed for each of the behaviours in the investigation (four separate item plots in the case of the present example). The individual item plots maintain the same configuration of points as the main POSA plot but the labeling of the points differs. In this case, each item plot indicates the presence or absence of a given

behaviour for each offender. The item plot is then partitioned into regions in an attempt to optimize the separation of profiles that contain a given behaviour from those that do not (see Figure 5). If several items partition along the J-axis, a cumulative scale may be present. Essentially, this process enables the identification of particular behaviours from each theme that most closely approximate a perfect scale. As observed in Figure 5, items in this example adequately partition along the J-axis, suggesting the presence of a quantitative scale within the hypothetical hostility theme. While items may be also partitioned along different axes (e.g., L, X, Y, etc.), the focus will remain on the J-axis since interest in the current study lies in examining quantitative differences between offenders. Figure 6 depicts the superimposition of all four item plots onto one overall plot. Upon examining the overall plot, it is evident that profanity represents the lowest degree of hostility - all offenders engaged in profanity except for Ted. In contrast, stabbing entails the greatest degree of hostility – an action only performed by Freddy. In addition to stabbing, Freddy also performed all preceding behaviours on the scale (i.e., profanity, hitting, death threats).

The suitability of the item plot divisions is indicated by the *coefficient of weak monotonicity* (Santtila, Sandnabba, Alison, & Nordling, 2002). This index ranges from 0 to 1, indicating the degree to which the partitions adequately separate the data into exclusive groups. In other words, it is a measure of how well the partition separates profiles in which a given behaviour is present from those profiles in which the behaviour is absent. As suggested by Shye (1985), a coefficient of .80 or higher is indicative of a good degree of fit. Again, given the potentially unreliable nature of police data, coefficients of .70 or higher were considered acceptable. Accordingly, for each scale, an

item's inclusion criteria was twofold: 1) the coefficient of weak monotonicity associated with the J-axis was higher than the coefficients associated with all remaining axes, and 2) the coefficient of weak monotonicity on the J-axis exceeded .70.

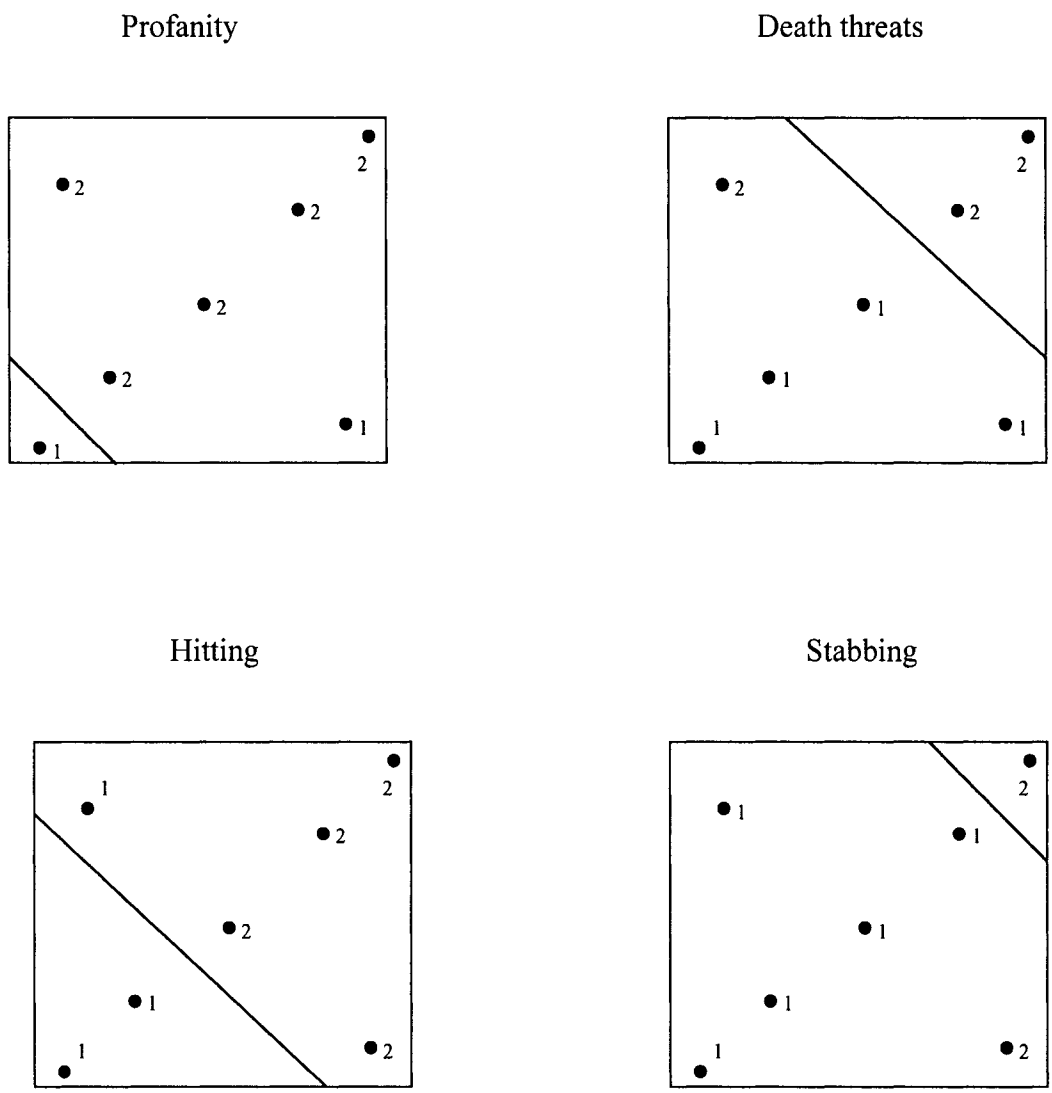


Figure 5. Sample item plots for hostility behaviours.

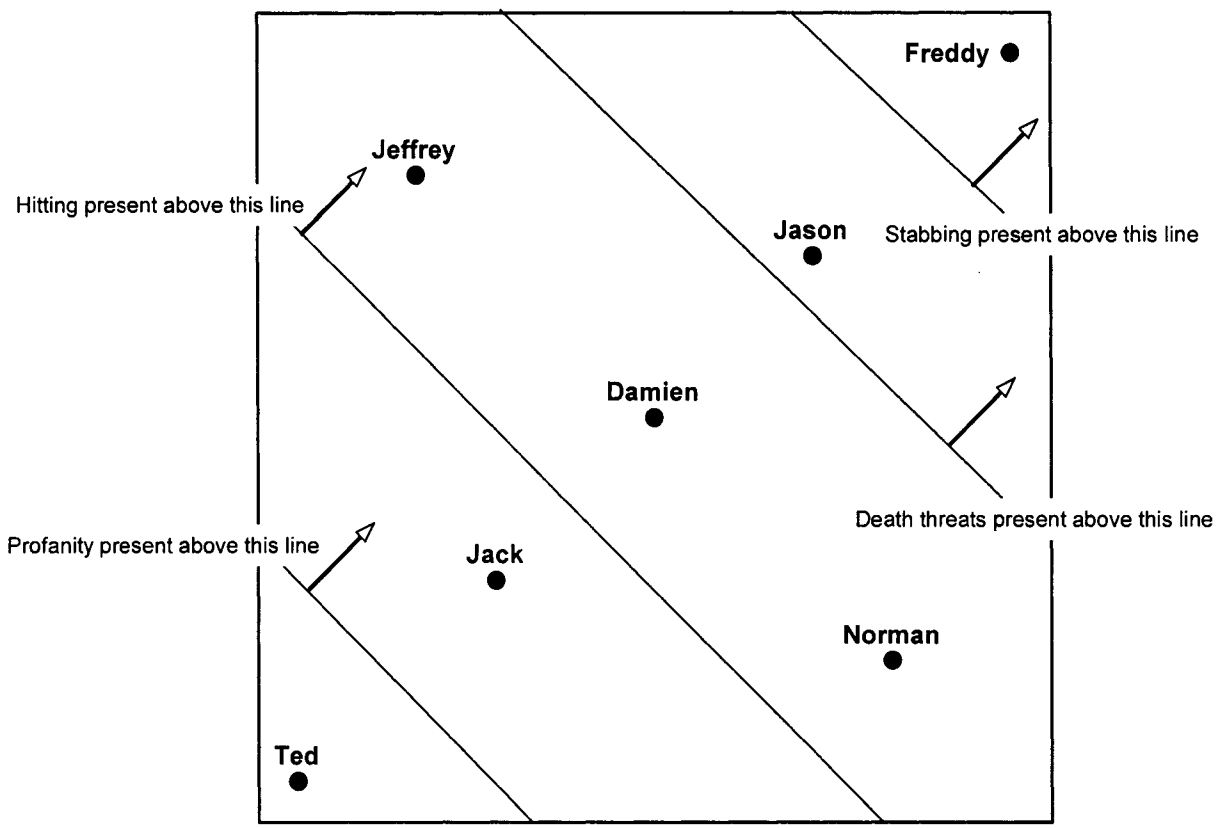


Figure 6. Superimposition of item plots for sample hostility behaviours.

In the context of the present thesis, six POSAs were run on the sample of 177 crimes committed by 59 offenders (3 crimes per offender) for the main analysis. Thus, one POSA was conducted per theme, in both criminal and non-criminal domains. For the purposes of the aggregation analysis, three additional POSAs were conducted on the sub-sample of 32 offenders (i.e., one for each theme in the criminal domain exclusively). The particular software used to conduct the POSAs was Partial Order Scalogram Analysis by Coordinates & Lattice Space Analysis (POSAC/LSA; Shye, 1985).

Testing the primary assumptions of temporal stability/consistency.

Each offender received a set of J-scores corresponding to his degree of manifestation of each behavioural theme for each homicide in the series (i.e., nine scores per offender – hostility scores from crimes 1, 2, and 3, etc.). J-scores belonging to a common theme were then correlated across each crime pair in the series. Kendall's *tau* was considered appropriate as a conservative measure of correlation in order to control for ties in the rank ordered data (Cliff, 1996). Each correlation pair was then tested for significant differences through a modified version of the Fisher *r*-to-*z* formula for use with dependent samples (Steiger, 1980). To examine the issue of cross-situational consistency, J-scores belonging to a common theme were correlated across criminal and non-criminal domains.

The nature of the behavioural theme.

In order to examine the impact of the behavioural theme itself on measures of stability, the average correlation was considered for each theme and compared to that generated for each of the remaining themes. To assess the impact of the behavioural theme itself on measures of cross-situational consistency, correlations between

corresponding themes in the criminal and non-criminal domains were compared through the modified Fisher *r*-to-*z* formula for dependent correlations.

Dominant offender types.

Offenders adhering to a dominant thematic type were identified according to the following criteria. For each crime of an offender's series, the percentage of behaviours displayed from each theme was determined. If the overall percentage of behaviours manifested from a given theme exceeded the percentage of behaviours expressed from the remaining two themes in combination, a dominant theme was assigned for that crime (e.g., Salfati, 2000). If the offender exhibited the same dominant theme across each of his three crimes, he was identified as a dominant offender type. Those offenders not adhering to the above condition for thematic dominance were excluded from subsequent analyses - i.e., either offenders who did not display a dominant type (hybrids) in at least one of their crimes or displayed different dominant types across their crime series. For example, an offender whose percentage of control-related behaviours exceeded that of either hostility or involvement-related behaviours across all three crimes would be identified as a predominantly controlling offender. In contrast, an offender displaying a dominant control theme on his first two crimes but was predominantly hostile in the context of his last crime would not be identified as a dominant type. As described above, analyses of stability/consistency were conducted separately for this sub-sample of dominant offender types. Correlations pairs were tested for equality based on the standard Fisher transformation for independent samples (Neter, Kutner, Nachtsheim, & Wasserman, 1996).

Aggregation.

In order to explore the impact of aggregation on measures of stability, the six crimes committed by each individual in the aggregation sub-sample (n=32) were first randomized in order to control for potential temporal and/or learning effects. Correlations were yielded between: 1) J-scores for two offences selected from each offender's series (i.e., single crimes), 2) the average J-scores of two crime pairs selected from each offender's series (i.e., average of two crimes) and 3) the average J-scores of the first three crimes and last three crimes of the randomized series (i.e., average of three crimes). Finally, comparisons were conducted between stability coefficients associated with each of the above levels of aggregation through the modified Fisher r-to-z formula to determine if the process of aggregation has a significant impact on levels of behavioural stability. In order to additionally explore the potential impact of aggregation on measures of cross-situational consistency, correlations were also considered between J-scores associated with each level of aggregation in the criminal domain with J-scores associated with corresponding themes in the non-criminal domain.

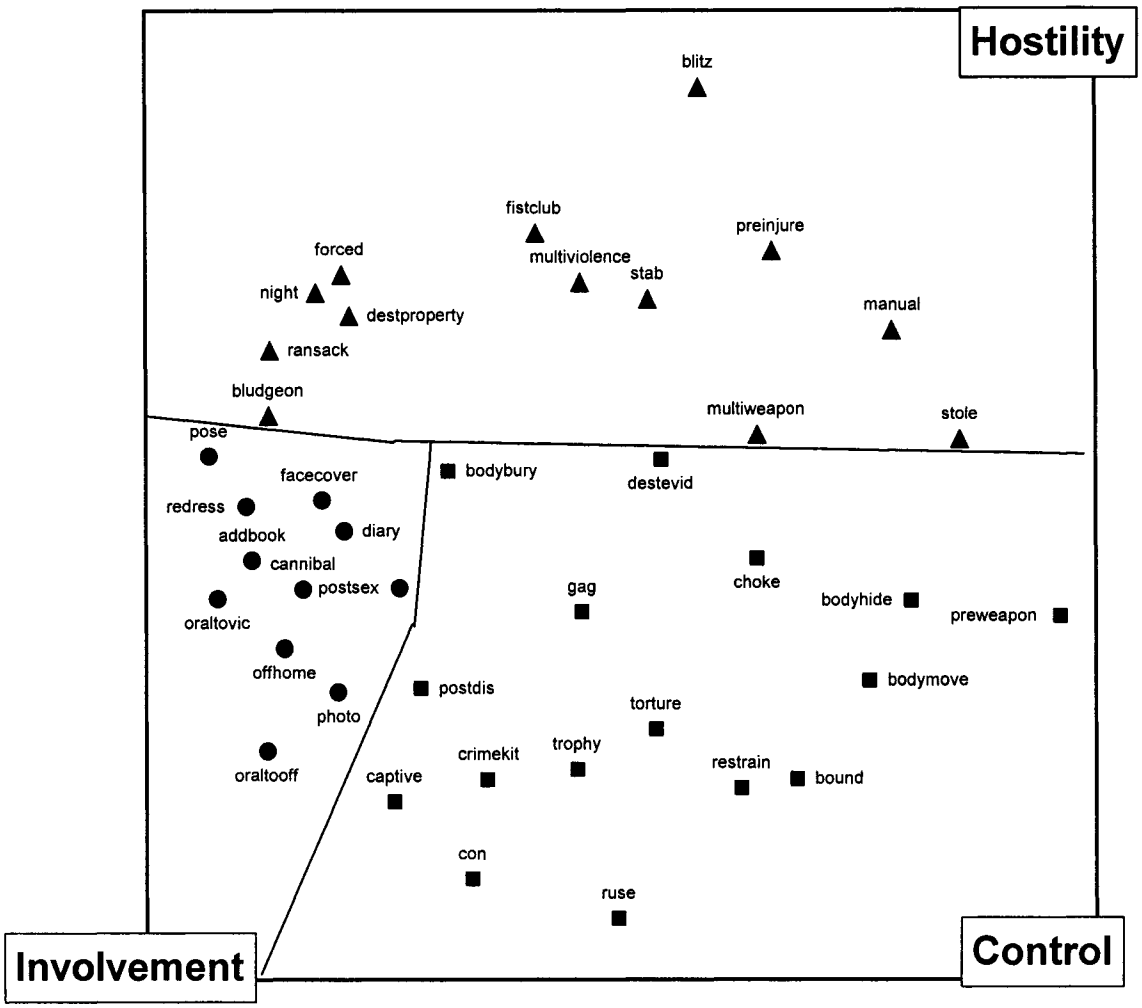
Results

Proximity Scaling: The Delineation of Behavioural Themes

A 2-dimensional PROXSCAL solution was used to represent the joint co-occurrence of the 40 crime scene behaviours within the criminal domain (see Figure 7). The normalized raw stress associated with the configuration was .09 achieved in 14 iterations. Tucker's coefficient of congruence was .95. Both of these values indicate a good degree of fit between the graphic representation of the behaviours and the original association matrix. As illustrated, the hypothesized behavioural themes of hostility,

control, and involvement were generated, with 88% of items falling in their expected regions. Five crime scene variables were associated with themes contrary to initial predictions. Namely, night entry into the victim's home (anticipated to be control-related) shared a region with hostility behaviours. Choking of the victim and the collection of trophies (anticipated to fall under hostility and involvement, respectively) were both located in the control region. Finally, posing of the victim and post-mortem sex (anticipated to be related to hostility and control, respectively) were situated with the involvement behaviours. Potential justifications for these contradictory findings are provided in the forthcoming discussion.

Items located in each respective region of the PROXSCAL plot are listed in Table 4, along with their associated frequencies across all crimes. K-R 20 coefficients associated with each theme were high, ranging from .76 to .87. These values are particularly impressive considering the data were not originally collected for empirical research.



2-dimensional solution
Normalized raw stress = .09
Tucker's coeff. of congruence = .95

Figure 7. PROXSCAL plot for the criminal domain.

Table 4

Criminal Domain: Frequency of Crime Scene Behaviours Within Each Theme

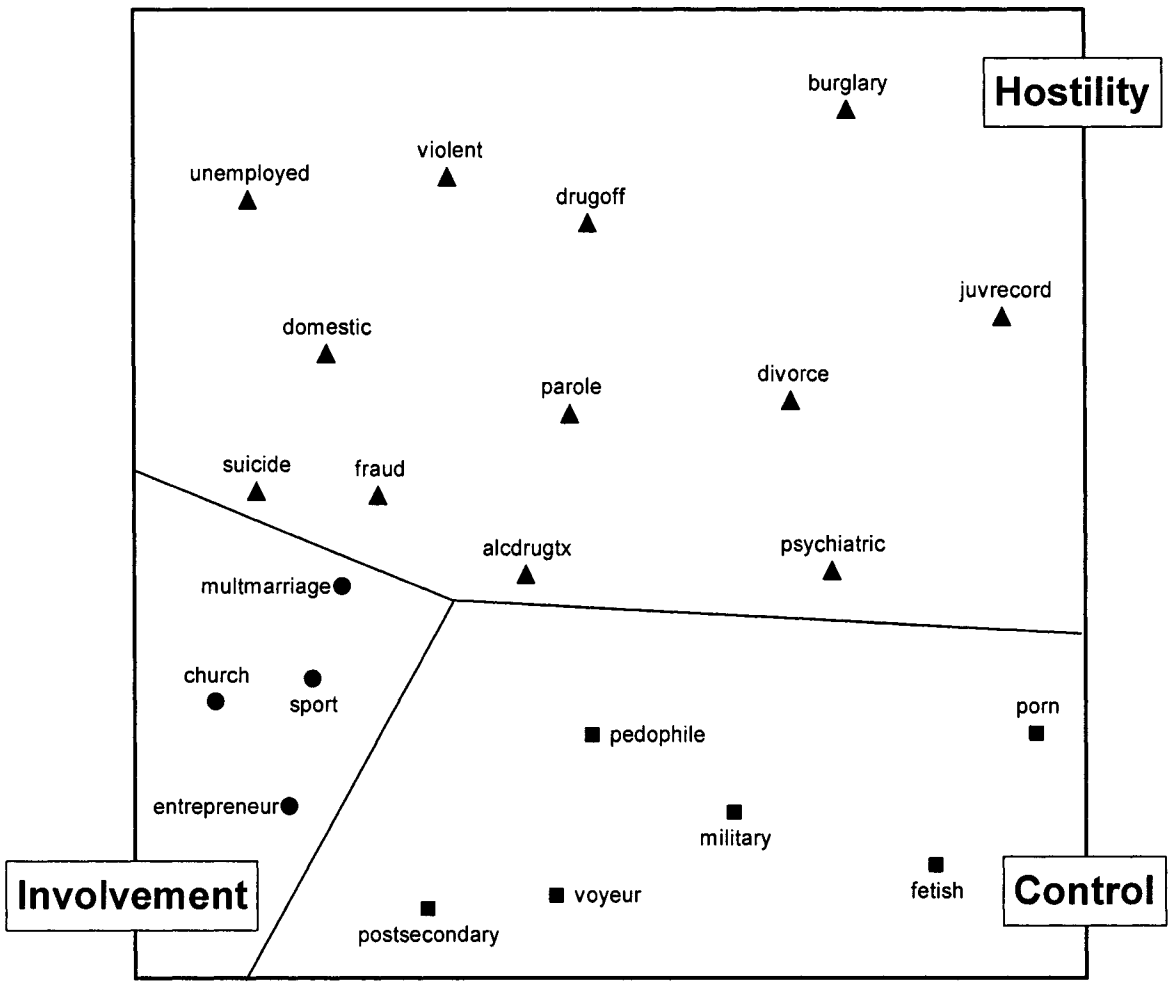
Hostility (n = 13, K-R 20 = .87)	Control (n = 16, K-R 20 = .76)	Involvement (n = 11, K-R 20 = .81)
Stole (63.3%)	Weapon pre-selected (preweapon) (89.3%)	Oral sex to offender (oraltooff) (17.5%)
Manual attack (manual) (60.5%)	Body hidden (bodyhide) (55.4%)	Diary (15.3%)
Pre-mortem injuries (preinjure) (44.1%)	Bound (52.5%)	Photo (14.1%)
Multiple weapons (multiweapon) (41.8%)	Body moved (bodymove) (48.0%)	Post-mortem sex (postsex) (12.4%)
Stabbing (stab) (37.9%)	Restraints brought (restrain) (44.6%)	Victim posed (pose) (10.2%)*
Fist or club (fistclub) (33.9%)	Ruse (43.5%)	Body in offender home (offhome) (10.2%)
Blitz attack (blitz) (33.3%)	Torture (39.0%)	Cannibalism (cannibal) (7.3%)
Multiple violence (multiviolence) (32.2%)	Choke (36.7%)*	Victim face covered (facecover) (6.8%)
Destroy property (destproperty) (19.2%)	Destroy evidence (destevid) (36.2%)	Oral sex to victim (oraltovic) (5.1%)
Forced entry (forced) (18.6%)	Gag (31.1%)	Used victim address book (addbook) (4.0%)
Night entry (night) (17.5%)*	Trophy (32.8%)*	Victim redressed (redress) (1.7%)
Ransack (13.6%)	Con (32.2%)	
Bludgeon (9.0%)	Crimekit (28.8%)	
	Captive (28.8%)	
	Post-mortem dismember (postdis) (19.8%)	
	Body bury (13.6%)	

Note: Items marked with an asterisk (*) did not fall within their predicted theme in the proximity scaling analysis.

Similarly, a 2-dimensional PROXSCAL solution was generated for the 22 variables associated with the non-criminal domain (i.e., offender background characteristics) (see Figure 8). Given 20 iterations, the achieved measure of normalized raw stress was .09 and Tucker's coefficient of congruence was .96. Both values are indicative of a good degree of fit. As with the criminal domain, the predicted behavioural themes of hostility, control, and involvement were generated, with 82% of items falling in their expected regions. Four background variables were associated with themes counter to hypotheses. Fraud, although predicted to be an index of control, fell in the hostility region of the plot. Voyeurism and pedophilia, originally considered to be involvement-related, were located in the control region. In contrast, although predicted

to be related to control, entrepreneur was situated among the involvement behaviours. Again, these contradictory findings will be explored in the context of the ensuing discussion.

Items and associated frequencies related to themes in the non-criminal domain are listed in Table 5. K-R 20 coefficients range from .53 to .61, notably lower than those emerging across themes in the context of crime scene behaviours (i.e., criminal domain), thus suggesting a lower degree of structural coherence in the non-criminal domain. This finding was not entirely unexpected given the limited sample of background characteristics available for analysis in the original data file, the interpretational ambiguity and/or definitional breadth of certain items (e.g., psychiatric history) and the generally unverifiable nature of investigative data. Similar studies in the field of investigative psychology have considered K-R 20s in the range of .50 and .60 to be acceptable given the inherently unreliable nature of police records (e.g., Canter et al., 2003; Canter & Fritzon, 1998).



2-dimensional solution
Normalized raw stress = .09
Tucker's coef. of congruence = .96

Figure 8. PROXSCAL plot for the non-criminal domain.

Table 5

Non-Criminal Domain: Frequency of Offender Background Characteristics Within Each Theme

Hostility (n = 12, K-R 20 = .58)	Control (n = 6, K-R 20 = .61)	Involvement (n = 4, K-R 20 = .53)
Burglary (62.7%)	Pornography (porn) (69.5%)	Entrepreneur (18.6%)*
Juvenile record (juvrecord) (61.0%)	Fetishism (fetish) (62.7%)	Church member (church) (15.3%)
Psychiatric history (psychiatric) (37.3%)	Military (29.8%)	Sports involvement (sport) (8.5%)
Unemployed (35.6%)	Post-secondary education (23.7%)	Multiple marriages (multmarriage) (1.7%)
Divorced (35.6%)	Voyeur (23.7%)*	
Violent offence (violent) (32.2%)	Pedophile (22.0%)*	
Drug offence (drugoff) (27.1%)		
Domestic abuse (domestic) (22.0%)		
Parole (16.9%)		
Fraud (15.3%)*		
Alcohol/drug treatment (alcdrugtx) (15.3%)		
Suicide attempt (suicide) (10.2%)		

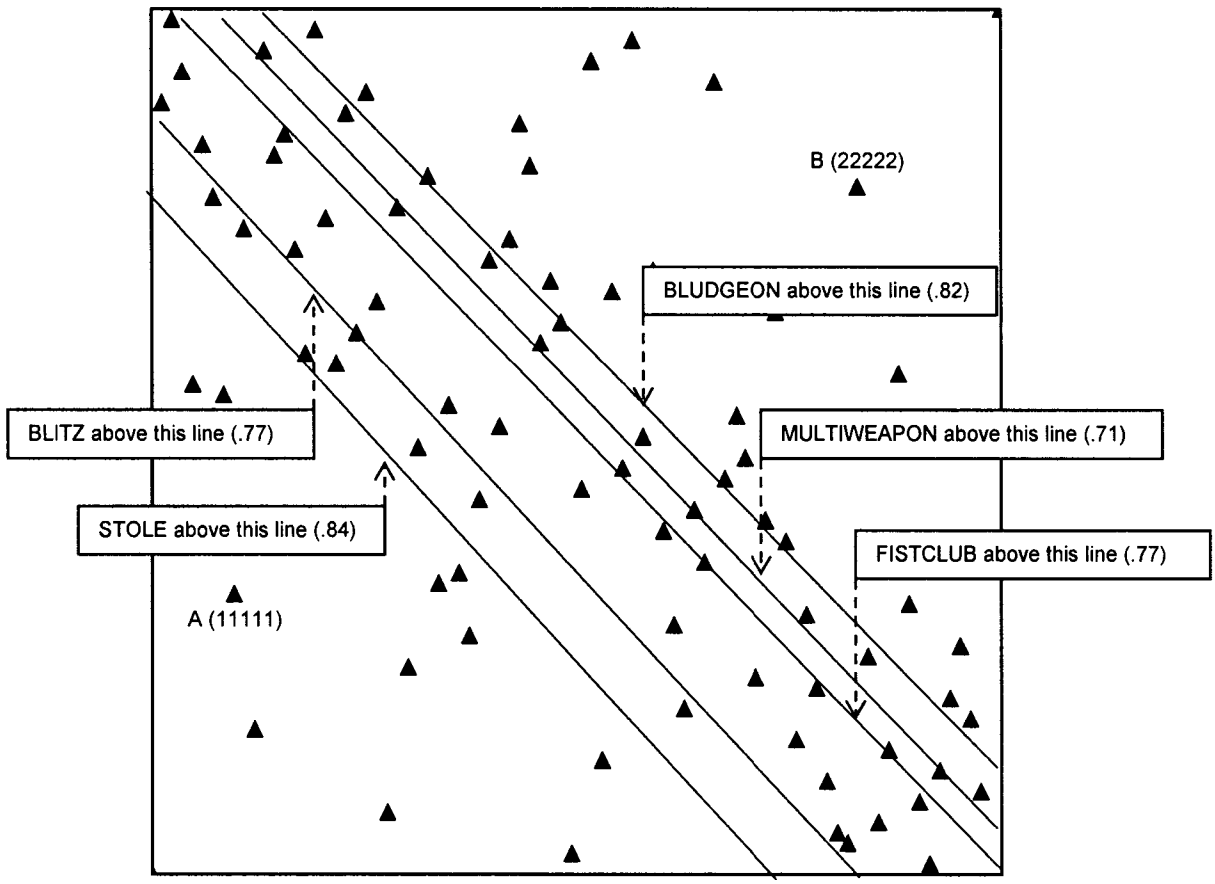
Note: Items marked with an asterisk (*) did not fall within their predicted theme in the proximity scaling analysis.

Partial Order Scalogram Analysis: The Identification of Quantitative Scales

Within the criminal domain, data were subjected to three POSAs – one related to the behaviours encompassed within each theme (i.e., see Table 4). Each analysis was conducted on the 177 crimes committed by the main sample of 59 offenders (i.e., 3 crimes per offender).

The overall hostility plot (criminal domain) is illustrated in Figure 9, depicting 84 different profiles. Each point on the configuration indicates a distinct offence profile, potentially shared by one or more individual crimes. Upon visual inspection of the plot, a substantial amount of qualitative and quantitative dispersion appears to exist as indicated by the distribution of points across the surface of the configuration. However, given the interest in quantitative differences within the present thesis, only the J-axis dispersion was considered. Behaviours with coefficients of weak monotonicity of .70 or

greater on the J-axis that could be reasonably partitioned were included in the formation of a cumulative scale. The coefficients of weak monotonicity associated with scalable items are indicated on the main plots. The individual item plots corresponding to each scalable behaviour emerging from the analysis are included in Appendix C.



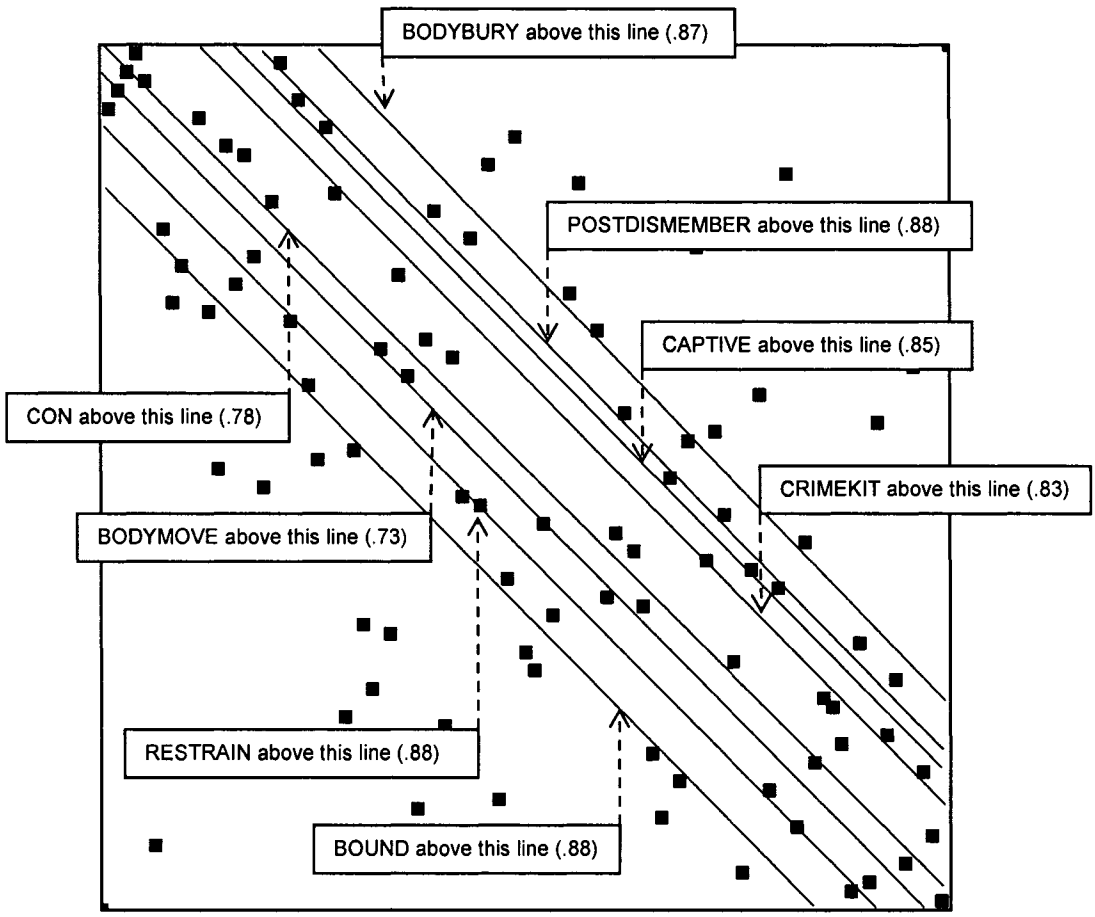
Note: Coefficients of weak monotonicity are specified in brackets.

Figure 9. POSA plot for the theme of hostility (criminal domain).

As indicated on the main hostility plot (Figure 9), the five behaviours that scale quantitatively are, in sequential order: *stole* (stealing from the victim), *blitz* (blitz attack), *fistclub* (attacked victim with fist or club), *multiweapon* (used multiple weapons during the crime), and *bludgeon*. In other words, stealing from the victim conveys the lowest degree of hostility and bludgeoning the highest. In practical terms, an offender that bludgeons his victim has *likely* performed all other behaviours occurring at a lower point on the scale. It is this particular set of scalable behaviours that contributes to each offender's J-axis score related to hostility in the criminal domain. As an additional illustration, consider profile A (11111) (related to crime 12 as indicated in the data file) situated in the bottom-left quadrant of the above plot. In this particular crime, no behaviours associated with the hostility scale depicted above were performed. In contrast, consider profile B (22222) (related to crime 67) located in the upper-right quadrant of the POSA plot. In this specific crime, all hostility behaviours on the above scale were performed.

The same rationale holds for the interpretation of all other quantitative scales associated with the remaining themes. Scalable control behaviours from the criminal domain are illustrated in Figure 10. This particular analysis yielded 95 different profiles. The following behaviours formed a quantitative scale of control (presented in increasing order): *bound* (victim's body bound), *restrain* (offender brought restraints to scene) *bodymove* (offender moved victim's body from scene), *con* (con approach), *crimekit* (offender prepared crime kit), *captive* (offender held victim captive), *postdis* (offender dismembered victim post-mortem) and *bodybury* (offender buried victim's body).

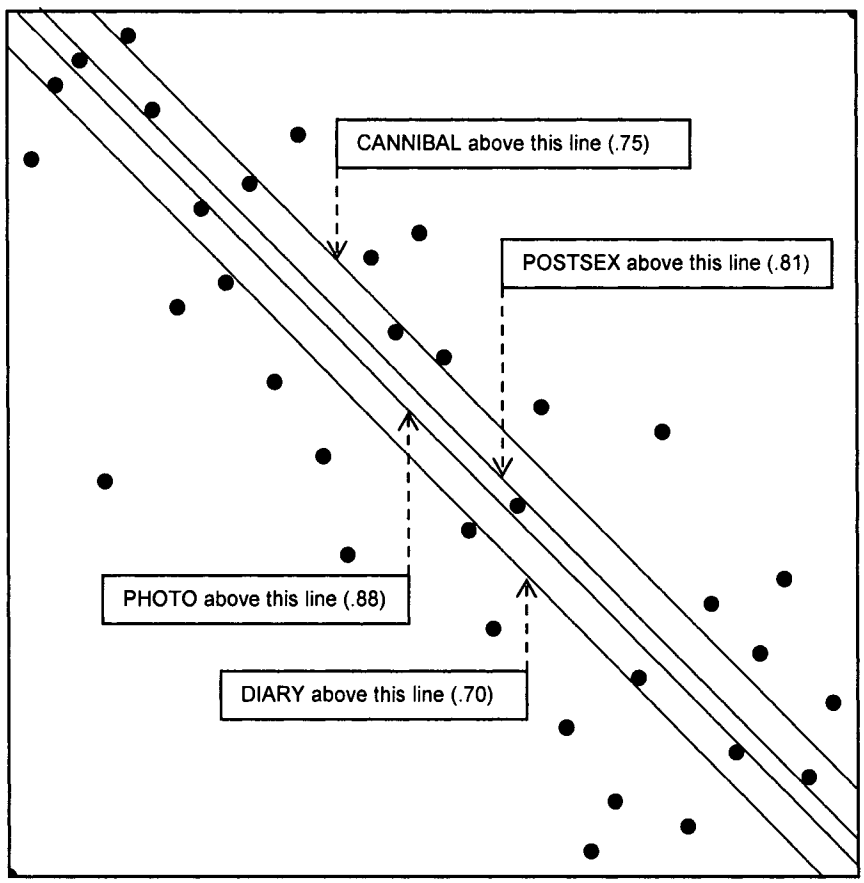
Therefore, burying a victim conveys the greatest degree of control and likely entails the performance of the behaviours preceding it on the scale.



Note: Coefficients of weak monotonicity are specified in brackets.

Figure 10. POSA plot for the theme of control (criminal domain).

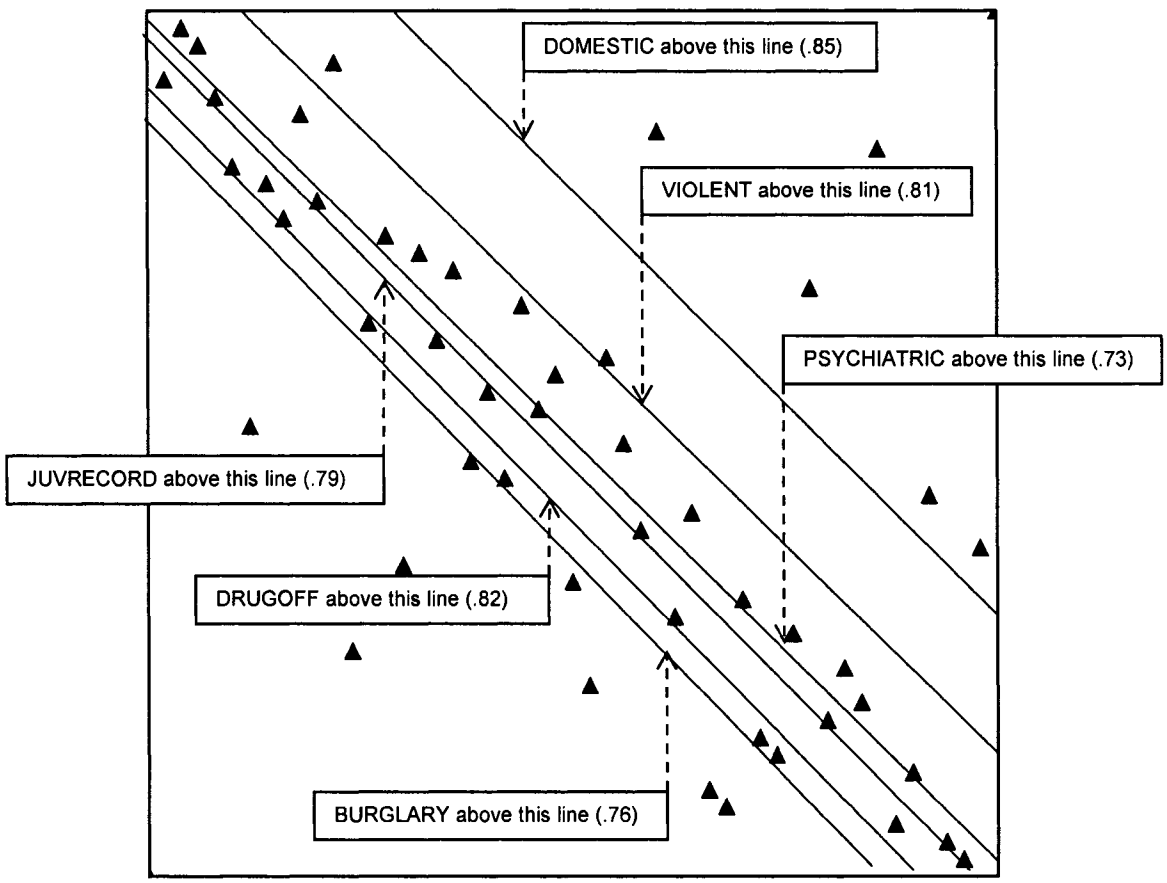
The POSA plot for involvement behaviours related to the criminal domain generated 36 different profiles and is illustrated in Figure 11. Compared to the hostility and involvement themes, there is noticeably less dispersion on the J-axis in this Figure and therefore, less absolute quantitative differentiation between profiles. However, five scalable behaviours were identified: *diary* (offender kept crime diary), *photo* (offender took photos/videos of crime), *postsex* (offender engaged in necrophilia with victim) and *cannibal* (cannibalism/drinking blood). Maintaining a diary of one's crimes therefore conveys the lowest degree of involvement and cannibalising the victim expresses the highest manifestation of the theme.



Note: Coefficients of weak monotonicity are specified in brackets.

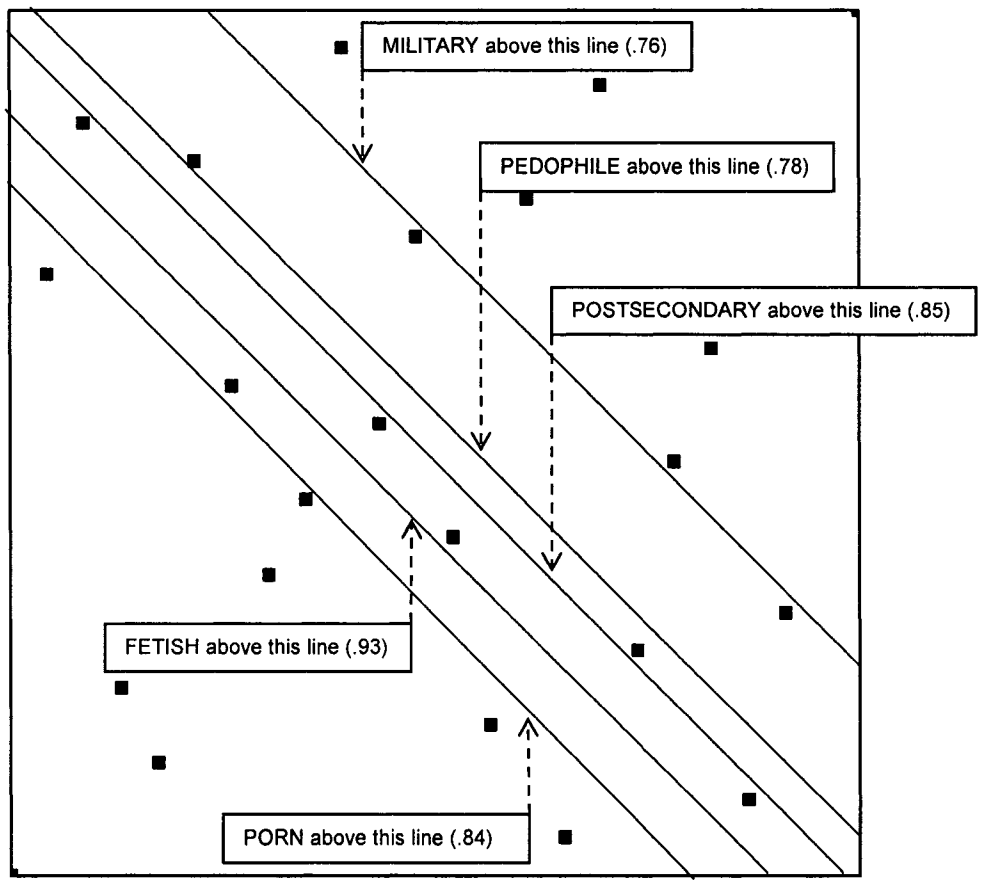
Figure 11. POSA plot for the theme of involvement (criminal domain).

Three additional POSAs were conducted for each corresponding theme in the non-criminal domain. Background characteristics related to hostility yielded 51 different profiles illustrated in Figure 12. Presented in order of increasing hostility, scalable items were identified as: *burglary*, *drugoff* (history of drug offences), *juvrecord* (juvenile record), *psychiatric* (psychiatric history), *violent* (history of violent crime), and *domestic* (history of domestic assault). In this case, the commission of domestic assault is equated with the highest expression of hostility and generally entails the performance of all behaviours preceding it on the scale. As illustrated in Figure 13, the POSA plot related to the theme of control in the non-criminal domain generated 24 different profiles and resulted in the quantitative scaling of five behaviours. In order of increased expression of control, the scale consists of *porn* (pornography), *fetish* (fetishism), *postsecondary* (post-secondary education), *pedophile* (pedophilia) and *military* (military background). Finally, due to the low frequency of behaviours performed in the involvement theme, especially as it pertains to those sampled in the non-criminal domain (see Table 5), the relevant POSA only produced nine different profiles as shown in Figure 14. Nonetheless, *entrepreneur* and *church* (church member) formed a quantitative scale, the latter conveying a greater degree of involvement than the former.



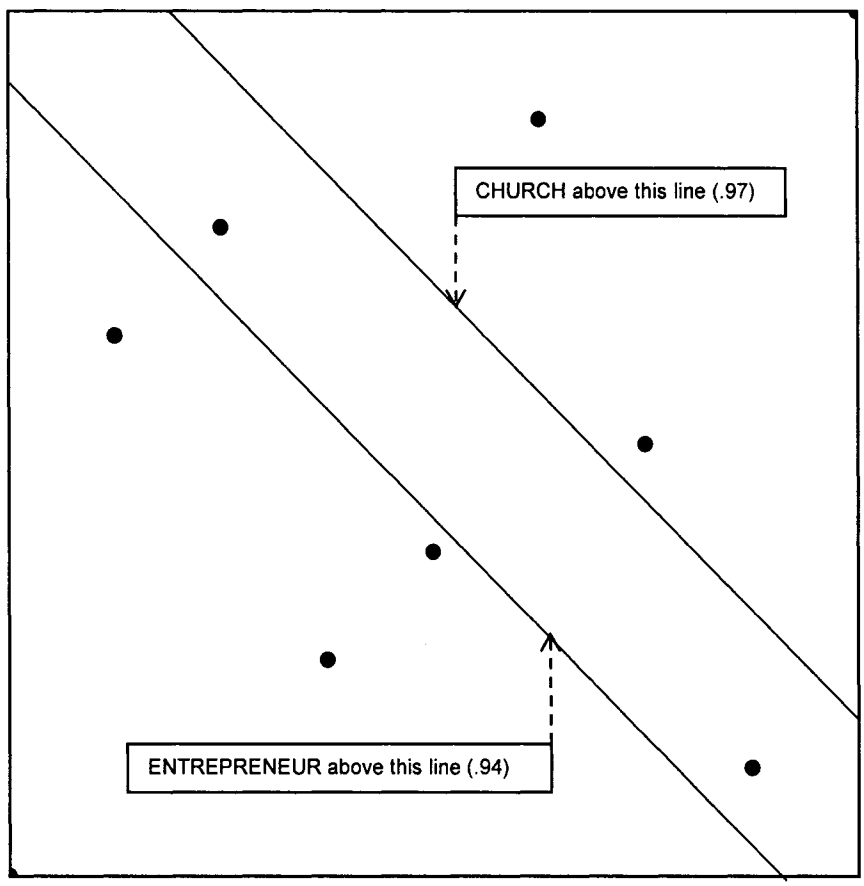
Note: Coefficients of weak monotonicity are specified in brackets.

Figure 12. POSA plot for the theme of hostility (non-criminal domain).



Note: Coefficients of weak monotonicity are specified in brackets.

Figure 13. POSA plot for the theme of control (non-criminal domain).



Note: Coefficients of weak monotonicity are specified in brackets.

Figure 14. POSA plot for the theme of involvement (non-criminal domain).

As mentioned, the scalable behaviours specified above are the basis upon which J-scores are derived – the scaled values ranging from 0-200 by which offenders and crimes are quantitatively differentiated. From the analysis of the criminal domain, each offender was assigned nine J-scores (3 crimes x 3 themes). From the analysis of the non-criminal domain, each offender was simply attributed three J-scores (one corresponding to each theme).

General Tests of Temporal Stability

Although the J-scores themselves are not provided in the present thesis, the structure of the data matrix constructed from these values is presented in Table 6. J-scores belonging to a common theme were correlated across each crime pair in the series. Stability coefficients (Kendall's *tau*) yielded from correlating J-scores from a common theme across each crime pair are presented in Table 7. As hypothesized, offenders generally displayed high temporal stability across their crime series, with stability coefficients ranging from .67 to .85. All correlations were significant at $p <$ .001, yet no significant differences were found between the correlations themselves, nor were significant differences revealed between correlations attributed to each crime pair across the series. [7]

[7] As an additional analysis, levels of stability/consistency of behavioural themes theorized to be psychologically coherent were compared to a random subset of items in order to ensure that the former would indeed yield higher levels of stability/consistency than the latter. Levels of both stability/consistency for random behaviours were significantly lower than those associated with all thematic groupings, therefore suggesting that thematic cohesion underlying hypothesized behavioural clusters is an essential step in observing stability and consistency.

Table 6

Examining Temporal Stability: Sample Data Matrix Constructed from J-scores related to Hostility (H_J), Control (C_J), and Involvement (I_J)

Offender	Crime 1			Crime 2			Crime 3		
1	H_{J1}	C_{J1}	I_{J1}	H_{J2}	C_{J2}	I_{J2}	H_{J3}	C_{J3}	I_{J3}
2	H_{J1}	C_{J1}	I_{J1}	H_{J2}	C_{J2}	I_{J2}	H_{J3}	C_{J3}	I_{J3}
3	H_{J1}	C_{J1}	I_{J1}	H_{J2}	C_{J2}	I_{J2}	H_{J3}	C_{J3}	I_{J3}
...	...	...	...	...	...	...	...	...	...

Table 7

Correlations Between J-Scores on Three Crimes for Each Behavioural Theme

Comparison	Hostility	Control	Involvement	Average correlation per crime pair
Crime 1 – Crime 2	.71*	.85*	.71*	.76*
Crime 2 – Crime 3	.69*	.82*	.84*	.78*
Crime 1 – Crime 3	.67*	.74*	.75*	.73*
Average correlation per theme	.69*	.80*	.77*	

* :Correlation is significant at the .001 level (1-tailed)

General Tests of Cross-Situational Consistency

A sample data matrix constructed to examine the issue of cross-situational consistency is presented in Table 8. Correlations achieved by comparing non-criminal to criminal J-scores (averaged across each of the offender's three crimes) across common themes are specified in Table 9. As expected, measures of cross-situational consistency were not significant, with the exception of that achieved for the theme of control ($\tau = .36, p < .001$).

Table 8

Examining Cross-Situational Consistency: Sample Data Matrix Constructed from Non-Criminal and Average Criminal J-scores related to Hostility (H_J), Control (C_J), and Involvement (I_J)

Offender	Non-criminal			Criminal (average J-score)		
1	H_J	C_J	I_J	H_{Jav}	C_{Jav}	I_{Jav}
2	H_J	C_J	I_J	H_{Jav}	C_{Jav}	I_{Jav}
3	H_J	C_J	I_J	H_{Jav}	C_{Jav}	I_{Jav}
...	...	...	...	...	...	...

Table 9

Correlations Between J-Scores Across Crime Scene and Background Themes

Comparison	Hostility	Control	Involvement
Background – Average crime scene	.13	.36*	.17

* :Correlation is significant at the .001 level (1-tailed)

The Impact of the Behavioural Theme Itself on Stability/Consistency

In order to examine the impact of the behavioural theme itself on measures of stability in the criminal domain, the average correlation was considered for each theme and compared to that generated in each of the remaining themes (see Table 7). Although the average correlation for each theme was significant at $p < .001$, a significant trend emerged when the mean hostility coefficient (.69) was compared to the mean control coefficient (.80) ($z = 1.34, p < .1$). Thus, there is a tendency for a greater degree of stability to emerge within the control theme than the hostility theme. As determined in the previous analysis, the control theme alone demonstrated cross-situational consistency. Furthermore, when the correlation attributed to the consistency of this particular theme was contrasted with those of the remaining themes, significant trends emerged. As indicated in Table 8, trends towards significant differences were found when the level of consistency related to control was contrasted to that of hostility ($z = 1.32, p < .1$) as well as involvement ($z = 1.11, p < .1$).

The Impact of Dominant Offender Types on Stability/Consistency

As described earlier, if an offender exhibited the same dominant theme across each of his three crimes, he was identified as a dominant offender type (see Table 9 for frequency counts). To reiterate, for each crime, dominant themes were identified based on the criterion that the overall percentage of crime scene behaviours manifested from a given theme exceeded the sum of the percentage of behaviours expressed from the remaining themes. A total of 46 offenders adhered to this criterion (24 predominantly hostile across their entire crime series and 22 predominantly controlling across their

entire series). It was necessary to exclude the involvement-type from this analysis due to absence of dominant offenders related to this particular theme.

Table 10

Frequency of Dominant Offender Types for Each Crime

Dominant type	Crime 1	Crime 2	Crime 3
Hostility	26	26	25
Control	22	23	25
Involvement	0	0	0
Hybrid	11	10	9
Total	59	59	59

Stability coefficients yielded from this sub-sample are given in Table 11. As with the main analysis, all correlations were significant at $p < .001$. Tests of significance between correlations through Fisher r-to-z revealed a significant difference between controlling (.82) and hostile (.54) offender types on the theme of hostility ($z = 1.75, p < .05$).

With respect to cross-situational consistency, no significant correlations were obtained across domains for predominantly hostile offenders. Notably, predominantly controlling offenders displayed cross-situational consistency on themes of control ($\tau = .34, p < .05$) and involvement ($\tau = .30, p < .05$).

Table 11

J-score Correlations Across Crimes for Dominant Offender Types

Offender group	Hostility Theme				Control Theme				Involvement Theme			
	C1-C2	C2-C3	C1-C3	Mean	C1-C2	C2-C3	C1-C3	Mean	C1-C2	C2-C3	C1-C3	Mean
Hostility	.52*	.63*	.47*	.54*	.66*	.72*	.54*	.64*	.61*	.86*	.70*	.72*
Control	.84*	.76*	.86*	.82*	.87*	.60*	.57*	.68*	.72*	.93*	.67*	.77*
Involvement		------				------				------		

* :Correlation is significant at the .001 level (1-tailed)

The Impact of Aggregation on Stability/Consistency

For the aggregation sub-sample, correlations were yielded between: 1) J-scores for two offences selected from each offender's series, 2) the average J-scores of two crime pairs selected from each offender's series and 3) the average J-scores of the first and last three crimes of the randomized series. All stability coefficients were significant at $p < .01$. However, tests of equality between correlations generally yielded no significant differences, with the exception of involvement. With respect to the involvement theme, significant differences emerged between correlations associated with the aggregation of three crimes (.86) and those associated with the aggregation of two crimes (.62) and single crimes (.62) ($z = 2.16$, $p < .05$ for both contrasts). No significant differences were revealed between levels of aggregation in the criminal domain on measures of cross-situational consistency (i.e., when compared to the implicitly aggregated background J-scores attributed to each theme).

Discussion

Rooted in the naïve trait perspective of personality psychology, two fundamental assumptions underlying methods of offender profiling are those of 1) temporal stability and 2) cross-situational consistency (Alison et al., 2002). While the temporal stability assumption has been corroborated in both the personality and forensic bodies of literature (e.g., Grubin et al., 2001; Olweus, 1979), the support for behavioural consistency has generally been weak (e.g., Mischel, 1999; Mokros & Alison, 2002). Although these concepts are borrowed from personality research, forensic psychologists have failed to operationalize them accordingly. Potentially due to convenience and/or a simple lack of awareness, the investigative literature has conceptualized stability/consistency in absolute rather than relative terms as intended. As a result, the methodological standards adopted in the forensic domain have likely led to underestimates in observed levels of stability/consistency within offender populations.

The present research attempted to abide by the theoretical framework outlined in personality psychology in order to appropriately explore the basic tenets of profiling methods. In other words, stability and consistency were equated with the degree to which offenders maintained respective rank orders in their expressed level of behavioural themes over time and across situations. Adhering to this definitional criterion, the current sample was found to display high levels of temporal stability across respective crime series, thus supporting the conclusions of previous research. Although violated at a general level, the cross-situational consistency assumption was met under qualified conditions. Namely, levels of consistency appear to be moderated by both offender type and the nature of the behavioural theme considered.

The Thematic Structure Underlying Serial Homicide

In both criminal and non-criminal domains, three distinct behavioural regions with associated scales emerged, corresponding to themes of hostility, control, and involvement. It is interesting that the same themes present in the context of the offender's crime series also emerge in his non-criminal life, in which he is interacting with friends, family and work associates in a relatively benign fashion. Moreover, similar thematic structures have notably been observed in the context of different crime types such as serial rape (e.g., Canter & Heritage, 1990) and sexual crimes perpetrated against children (e.g., Bennell et al., 2001). Thus, it is possible that such thematic parallels are indicative of more general modes of interpersonal interaction commonly held by offenders. Collectively, these findings suggest that beyond the behaviours central to the commission of a given crime (i.e., killing the victim in the case of homicide, vaginal penetration in the case of rape, etc.), actions of serial offenders may be broken down into discrete thematic components with some degree of confidence.

An examination of these behavioural modes of interaction provides structure to an offender's actions beyond the obvious perpetration of the crime itself (Canter, 1994; Hodge, in press). Referring to the PROXSCAL plot in Figure 7, the theme of hostility is dominated by aggression and fury, consisting of such actions as ransacking and multiple forms of brutal violence. The victim serves as a vicarious outlet or vehicle upon which the offender feels compelled to unleash his explosive rage. In contrast to the emotionally charged motive of hostility, there is a relatively lower expression of affect and a greater level of organization inherent in the theme of control, as conveyed by such actions as binding, dismemberment and the destruction of forensic evidence. Here, the victim is a

mere object or prop rendered passive as the offender asserts power over his unfortunate prey. Distinct from the regions of control and hostility, involvement-related behaviours suggest that the offender perceives his victim as a person with whom his desire for a deviant form of interpersonal interaction can be fulfilled. Therefore, he attempts to forge a bond of pseudo-intimacy with his victim, conveyed by a documentation of this "relationship" through diary entries and photos and in the extreme, the perpetration of necrophilia and cannibalism.

Thematic prevalence in serial homicide.

Due to the very nature of homicide (i.e., intentionally taking another human life through one or more acts of extreme violence), the hostility motive is instinctively prominent. This is confirmed by the fact that more hostile offenders emerged in the sub-analysis on dominant types (24 predominantly hostile versus 22 controlling). Despite the finding that more hostile-type offenders were identified, the pervasiveness of control-related behaviours manifested by the overall sample cannot be discounted. When considering item frequencies in the criminal domain (see Table 4), control-related items are indeed most prevalent throughout the sample as a whole. This theme features 16 items, 12 of which are exhibited in 30-90% of crimes. The pervasiveness of control in the context of serial homicide is also logical from a practical standpoint. Namely, a certain element of control and organization is required to evade detection by authorities while successfully perpetrating a homicide series (Canter, Alison, Alison, & Wentink, 2004).

It is notable that the theme of involvement is generally underrepresented in both the serial homicide offender's criminal and non-criminal life. This fact was evident

through both the low frequencies with which involvement-related behaviours were displayed (see Table 4) and the inability to identify dominant offender types on this theme. The underrepresentation of involvement is justifiable given the very nature of serial murder and its perpetrators. Logically, if one truly desired to establish an "intimate" relationship in the context of a crime, killing one's victim would be counter-productive to this end. Interestingly, involvement or pseudo-intimacy has emerged as a prominent thematic basis of serial rape, with control being relatively underrepresented as a motive in this crime (Canter et al., 2003). Hence, save for a minority of serial homicide offenders, the involvement-based motivation is simply incompatible with the action of brutally murdering one's victim.

All told, it is quite remarkable that such well articulated themes emerge in the context of serial homicide and other violent crimes given that 1) offenders cannot be observed during the commission of their crimes, and 2) data are not collected for research purposes. This finding contradicts the assertion of some who portray homicide offenders as chaotic, unpredictable "monsters" (Everitt, 1993). On the contrary, there is a high degree of underlying structure to the behaviour of serial killers – the same structure that appears to underlie most violent crime.

Item "misplacement".

In the present research, 85% of overall items empirically fell within hypothesized regions. However, the thematic location of certain behaviours emerging from the analysis did not accord with *a priori* predictions. Such inconsistencies may simply be due to error in prediction on the part of the author. However, item "misplacement" is most likely attributable to the typical lack of a unique motivational basis underlying

particular actions. For instance, a given behaviour may carry one meaning to an offender in a certain context but convey something entirely different in another context. Likewise, the performance of a specific behaviour in a given situation may have a completely different motivational basis for different offenders (Canter & Wentink, 2004; Holmes & DeBurger, 1988). Due to the intrinsic drive associated with serial homicide, certain researchers contend that a true appreciation of the motives ascribed to such crimes may only be fully understood through the eyes of the offender himself (Holmes & Holmes, 1998).

In the criminal domain, "choke" and "trophies", respectively predicted to fall under hostility and involvement, were located in the control region of the plot. Although choking is an aggressive and perhaps instinctively hostile action, it may also be interpreted as an act of physical domination against another person (Jacobson & Gottman, 1998). Similarly, it has been proposed that certain serial killers collect trophies (i.e., typically a body part from the victim), not as a souvenir of the pseudo-intimate "relationship" established with the victim, but rather as a reminder of the victory of having asserted total power over another human being (Holmes & Holmes, 2002). By collecting such mementos, the offender may figuratively "relive" the experiential high involved in gaining complete control over his prey.

"Post-mortem sex" was anticipated to fall under the control region of the plot due to the ultimate passivity of the victim in the context of the sexual act. However, this item actually co-occurred most highly with involvement behaviours. Retrospectively, it is reasonable to interpret post-mortem sex as an attempt at pseudo-intimacy or involvement on the part of the offender if he perceived himself unable to pursue a

conventional sexual relationship (Lunde, 1976). Anecdotally, such may have been the case with notorious serial killer Edmund Kemper (a.k.a., "The Co-Ed Butcher"). Kemper, purportedly a 25-year-old virgin at the onset of his crime series, targeted young female co-eds and performed post-mortem sexual acts on their corpses. He has expressed in subsequent interviews that he regarded certain victims as one would a "wife" or "girlfriend". In specific relation to his necrophilia, he has stated, "It was the only way they could be mine" (Ramsland, 2005).

"Posing" was initially predicted to impart hostility towards the victim given that in many cases, the offender will pose the corpse in a demeaning manner such as to convey shock and degradation (Keppel, 1997). However, this item fell in the involvement region of the plot. The misplacement of this item is potentially the result of ambiguities inherent in its definition (i.e., offender intentionally positioned the victim's corpse). Given the non-specific nature of the description, an indication of posing in the original data file was likely not limited to the degrading form of this action. There is evidence to suggest that serial killers may perform acts of "undoing" – an attempt at partial reparation or the symbolic erasure of certain aspects of the crime (Douglas & Olshaker, 1995). A broad definition of posing may conceivably encompass certain aspects of undoing, thus suggesting a form a remorse more closely tied to the theme of involvement (e.g., placing the victim in a peaceful position).

With respect to offender background characteristics, "fraud" was anticipated to reside in the control region given its non-violent nature and the relative degree of organization required to perpetrate this offence. Unexpectedly, this item empirically co-occurred with hostility behaviours. This finding is indirectly substantiated by the fact

that purely violent offenders are typically rare (Kjelsberg, 2002). In other words, there is a general concurrence of non-violent criminal behaviour in those considered violent offenders. Given that the hostility theme is composed both of items related to violent criminal behaviour was well as more general indices of criminality (e.g., drug offences, burglary, etc.), a logical association thus forms between a non-violent crime such as fraud and the overall theme of hostility. Additionally, it is also possible that the commission of fraud is an index of hostility towards society and its establishments in general rather than an indicator of person-directed antagonism. This issue may be a topic of interest for future research.

It was argued earlier that certain paraphilias, namely pedophilia and voyeurism, represented attempts on the part of the offender to forge pseudo-intimate ties with another individual or proxy target (i.e., thus anticipated to be involvement-related) (Holmes & Holmes, 2002). However, both these items ultimately fell in the control region of the plot. These erroneous predictions were perhaps due to the author's initial lack of appreciation for victim "passivity" (either in the form of physical distance or submission) being the critical feature underlying both voyeurism and pedophilia. In both cases, the offender is ultimately afforded a greater degree of control over situational variables than he would otherwise be in a genuine romantic relationship.

Finally, although predicted to be an index of control, "entrepreneur" was thematically related to involvement. Initially counter-intuitive, the item's location may potentially be understood through certain findings emerging from the industrial/organizational literature. Research suggests that forging solid interpersonal relationships, both personal and professional, is an integral component of entrepreneurial

endeavours (Rodriguez, 2001). Social support and kinship networks - including friends, family and work-related sources - buffer emotional exhaustion and act as key moderators of career satisfaction and success (Tetrick, Slack, Da Silva, & Sinclair, 2000). Therefore, an offender that pursues entrepreneurial ventures is not only likely to forge affiliative ties with associates and clientele, but is also apt to be dependent upon a social support network in order to buffer stressors inherent in running an independent business.

The Identification of Scales

Across both criminal and non-criminal domains, the application of POSA enabled the delineation of unidimensional scales within each behavioural theme. Characterized by reasonable psychometric properties, these scales were best partitioned along the J-axis, thus allowing for meaningful quantitative comparisons between offenders based the relative degree to which they manifested each theme. Notably, the scales yielded from this analysis were also characterized by an impressive degree of face validity. For example, consider the POSA plot related to involvement in the criminal domain, as illustrated in Figure 11. "Diary" is the first item on the scale, while "cannibal" is the last. Both items are related to an offender's desire for involvement or achievement of pseudo-intimacy in the context of a crime. However, maintaining a crime-related diary is clearly a milder form of involvement than cannibalising one's victim. A similar point can be drawn from the hostility plot in Figure 12. Burglary, occupying a low position on the scale, logically depicts a lesser manifestation of hostility than domestic assault, situated at the top of the scale.

It is worth reiterating the fundamental importance of applying POSA to identify scales as a means of quantifying offenders on particular themes. In contrast to a simple reliance on frequency counts and elevated K-R 20 coefficients, POSA allows one to ensure that items purportedly belonging to a common theme do indeed form a unidimensional quantitative scale on which individuals can be compared. For example, consider the item "bludgeon" from the hostility region and "redress" (offender redresses victim) from the involvement region of the PROXSCAL plot depicted in Figure 7. Although these items belong to different thematic groups, their close proximity in the geometric space suggests that they co-occur to a greater degree than, for instance, "bludgeon" and "stole" – two items belonging to the same theme. Based on degrees of co-occurrence alone, one might predict that a K-R 20 coefficient associated with "bludgeon" and "redress" might be higher than that associated with "bludgeon" and "stole". However, from the application of POSA, one can be assured that "bludgeon" and "stole" do indeed belong to the same cumulative scale of hostility (see Figure 9). Despite a relatively higher degree of co-occurrence, the items "bludgeon" and "redress" do not necessarily belong to a common underlying scale.

Temporal Stability: The Enduring Patterns of Homicidal Behaviour

The application of POSA enabled the identification of cumulative scales within each theme, permitting meaningful non-parametric comparisons of offenders/crimes on degrees of stability and consistency. Confirming previous findings (e.g., Grubin et al., 2001), the assumption of temporal stability was supported. Regardless of theme or offender type, individuals exhibited a high degree of behavioural stability across their crime series (correlations ranging from .67 to .85).

In fact, the impressively high stability coefficients generally achieved in the present research raise certain issues. Recall the relative lack of experimental control over situational variables in the forensic arena as well as the investigator's inability to engage in direct observation (Alison et al., 2001). This stands is stark contrast to the structure customarily established in studies emerging from the field of personality psychology (e.g., Funder & Colvin, 1991). Given one's inability to manipulate, let alone observe contextual variables in an investigative setting, it is conceivable that each crime in an offender's series actually varied considerably in terms of location, victim resistance, and so forth. This begs the question – Regardless of behavioural theme, how could stability coefficients achieved in the context of the present research demonstrate a range of values comparable to or higher than those obtained by personality psychologists?

Genesis of a serial killer: The stability of fantasy-related action.

Given the complete lack of control over situational variables in the investigative domain, the high levels of behavioural stability achieved suggest that traits (i.e., person factors) are outweighing situational factors for serial killers in the criminal context. In order to fully appreciate the behavioural stability of serial homicide offenders across respective crime series, it is worthwhile to briefly consider an etiological framework related to serial homicide. As discussed earlier with respect to personality research, there is evidence to suggest that certain pathological samples exemplify greater stability than do normative samples (Alker, 1972). Although serial homicide offenders typically do not suffer from extreme psychosis and have the ability to parade under the guise of normalcy for extended periods (Schecter & Everitt, 1996), they are unquestionably pathological as will soon be made evident (Norris, 1988). As such, one might anticipate

higher levels of behavioural stability within this particular population than would be expected of people in general.

The most viable theory of criminal behaviour specifically tailored to serial homicide is termed the Trauma-Control model (Hickey, 1991, 2002). While the stage for homicidal tendencies may be set by certain genetic abnormalities and soft signs of neurological damage resulting from physical trauma (Norris, 1988), homicidal behaviour is ultimately believed to emerge as a deviant by-product of developmental obstacles - usually a significant trauma or destabilizing event occurring in early childhood (e.g., parental rejection, abuse, etc.). The future offender, unable to adopt effective coping strategies to resolve his negative emotions, engages in a form of dissociation. The development of deviant fantasy is said to be integral to this dissociative process as the individual attempts to compensate for an abased sense of self-worth.

As stated by pioneering FBI profiler John Douglas (1995), fantasies serve to fuel homicidal behaviour and typically develop from early childhood. Due to the individual's inability to express anger and frustration towards the intended target (e.g., parental figure), fantasies generally incorporate proxy "victims" (e.g., a stranger bearing a striking resemblance to the target). Given the fact that, on average, a serial killer will begin his crime series between the ages of 25 and 35 (Hickey, 2002), the fantasy has thus developed for years as the killer's "script" is meticulously crafted. Initially, the script is honed through cognitive rehearsal and eventually proceeds to incorporate "dry-runs". For example, the budding offender might compile a crime kit or practice approaching potential victims without actually performing the homicidal act itself. Ed

Kemper, as a case in point, reportedly spent inordinate amounts of time envisaging all the murderous actions he could perform upon the young co-eds. Moreover, it has been estimated that in the year preceding the onset of his crime series, Kemper picked up and safely delivered in excess of 150 female hitchhikers as he rehearsed the preliminary steps towards the physical execution of his fantasy (Ramsland, 2005).

Ultimately, tension builds to such an extent that the fantasy is fully enacted and the homicide series begins. Although the offender experiences a brief period of tension reduction, he is unable to sustain the state of equilibrium temporarily achieved (Jackson & Bekerian, 1997). Given that the root of the trauma is still not confronted, feelings of anger and inadequacy soon re-emerge, the fantasies re-incur and the killer prepares to strike again. The serial offender's fantasy has been cultivated for years and is often scripted long before the first killing. Therefore, it is ultimately translated into highly ritualized actions that are particularly resistant to change (Ressler, Burgess, & Douglas, 1988).

Many of these ritualized behaviours are components of an offender's "signature", a highly reliable index for linking serial crimes due to its relative permanence (Douglas & Munn, 2002). Several variables located throughout the crime scene plot (Figure 7) are arguably not essential to the perpetration of the crime but rather, comprise signature behaviours that emerge directly from a serial killer's fantasy (e.g., covering the victim's face, cannibalism, posing, etc.). Thus, the prominence of pathological fantasy and related signature behaviours performed by serial homicide offenders likely account for the particularly high degree of temporal stability observed in the present sample.

The moderating effect of behavioural themes on temporal stability.

As discussed in the introduction of this thesis, measures of stability/consistency may be moderated by the nature of a given behaviour. A distinction was previously drawn between respondents (i.e., responses elicited by a clearly defined stimulus) and operants (i.e., behaviours spontaneously emitted by an individual). Personality research has found the latter to be expressed over a wider range of situations, hence characterized by higher levels of stability and consistency (McClelland, 1984).

While high levels of temporal stability were conveyed by all themes, control-related behaviours resulted in significantly greater stability coefficients relative to involvement and hostility items (.80, .77, and .69, respectively). Within the criminal domain, behaviours emerging under the control theme (e.g., weapon brought to scene by offender, post-mortem dismemberment, etc.) are primarily operants as they do not necessitate specific responses of the victim nor do they require the presence of situational variables outside the offender's immediate control. In contrast, the majority of behaviours attributed to the remaining themes may be considered respondents, more dependent upon the victim and/or the presentation of particular stimuli. For example, the use of a victim's address book to establish contact with future victims (i.e., involvement-related) clearly cannot occur if the victim does not own an address book or if one cannot be located by the offender. Likewise, forced entry into the victim's home (i.e., hostility-related) is an action which may not even culminate in homicide if, for example, a house alarm is activated, the potential victim escapes, or the victim is not home in the first place. Moreover, house windows or doors may not be secured, in which case forcible entry by the perpetrator is rendered unnecessary. It is also reasonable to argue that in

contrast to control-related actions, hostility behaviours are sometimes more erratic and frenzied in nature (e.g., bludgeoning). Therefore, they are likely performed under a higher degree of excitation and/or provocation and accordingly, display a lesser degree of stability.

The distinction drawn between operants and respondents is one plausible factor accounting for the relatively higher level of temporal stability characterizing the theme of control. An alternate possibility concerns a more practical issue pertaining to the differential reliability with which variables may be coded in the investigative context (Bennell & Jones, 2005). For a police investigator arriving at a homicide scene, it may be the case that control behaviours can be coded more readily, accurately and reliably than items related to hostility or involvement. For example, with respect to hostility-behaviours, the exact sequence of events in which certain injuries occurred (e.g., pre-versus post-mortem) may be unclear. Coding of involvement-related behaviours may be equally unreliable. For example, at the time of the initial investigation, it is likely unknown to police whether the offender seized the victim's address book or documented the event through photographs and crime diaries.

Typically, behaviours from the control region are more salient to police and accordingly, are more apt to be coded reliably. Save for items related to method of approach, which may be difficult to determine barring the presence of witnesses at the initial point of contact between victim and suspect, control-related behaviours are generally objective and observable. Upon discovery of a corpse, it is usually evident to the investigator whether, for example, the victim was buried, tortured or bound. Even certain control-related items that are less apparent are often easily verifiable through

autopsy reports (e.g., signs of extended captivity). If the subset of control-related behaviours can indeed be coded more reliably, this factor may also account for the emergence and detection of greater temporal stability within this particular region.

The moderating effect of dominant offender types on temporal stability.

Certain individuals tend to be governed primarily by specific themes or traits. When limiting the analysis to dominant offender types, it was determined that control-type individuals exemplified greater temporal stability than hostile offenders with respect to their patterns of criminal behaviour (.82 versus .54). Therefore, the moderating nature of the behavioural theme in its dominant form was indeed evident. An offender primarily engaging in control-related actions such as the binding of his victim and carrying restraints/weapons to the crime scene is much less apt to be influenced by contextual variables relative to his hostile and involvement-type counterparts. In other words, the controlling offender minimizes situational variance to a much greater degree and consequently, he has the ability to express dispositions in a more stable fashion, without the impingement of situational factors. In contrast, due to the sometimes frenzied and disorganized nature of his actions, a hostile-type offender may not anticipate certain situational factors and/or be particularly emotionally reactive to a victim's actions. Despite the absence of predominantly involving offenders in the present sample, it might also be argued that an individual of this type would also display lower behavioural stability relative to the controlling offender. Regarding his crime as pseudo-intimate, an involvement-type offender would presumably be highly attuned to his victim's responses and to an extent, allow these to mould the course of his script.

Cross-Situational Consistency: The "Jekyll & Hyde Syndrome"

Confirming predictions, while serial homicide offenders demonstrated particularly high levels of behavioural stability in the context of their crime series, the levels of consistency achieved between their criminal and non-criminal lives were low (see Table 9). This is corroborated in the literature and anecdotally (Mokros & Alison, 2002). This finding lends support to the argument that serial killers typically conceptualize their criminal and non-criminal lives in a completely different manner and accordingly, exemplify distinct modes of interaction in each. Situations of which the criminal domain is comprised (distinct homicides committed in series) are clearly more similar to one another than situations across criminal and non-criminal realms (e.g. committing murder versus attending a church outing). Given these different degrees of situational disparity, stability in the criminal domain is observed and consistency across criminal and non-criminal domains is violated. Furthermore, for the serial killer in general, the situation he largely creates for himself in the criminal realm is highly specific and provides an outlet for the expression of a carefully crafted fantasy (Hickey, 2002). However, subsequent to a homicide, the offender returns to the non-criminal realm, with an exceptional ability to resume a seemingly "normal" level of functioning. He sets entirely different situational boundaries for himself and often behaves in a manner completely inconsistent with the behavioural themes that pervade his criminal life. This extreme duality is evident in recently convicted serial killer Dennis Rader, the self-proclaimed "BTK" after the signature acts he performed in the context of his homicide series – namely, *binding, torturing*, and slowly *killing* his victims. Rader himself recognized his dual life and attributed his criminal behaviour to a form of

demonic possession: "I just know it's a dark side of me. It kind of controls me. I personally think it's a — and I know it is not very Christian — but I actually think it's a demon that's within me…" (Bardsley, Bell, & Lohr, 2005). Meanwhile, in his non-criminal life, Rader was an exemplary citizen that one would never deem capable of such atrocious acts. He was a devout family man, president of his Lutheran church, leader of a Cub Scouts group, and held a degree in Administration of Justice. After Rader's chilling confession in court, a close friend of 30 years aptly stated in disbelief, "The Dennis that is in jail is not the Dennis that I knew" (Cosby, 2005).

Control: A consistent theme.

Despite the general lack of consistency characterizing the sample of homicide offenders, the behavioural theme of control evidenced a significant degree of consistency across criminal and non-criminal domains (.36). Respecting the same line of reasoning presented with regards to the temporal stability of control-related behaviours, the distinction between operants and respondents also applies when considering the consistency attributed to this theme. As in the criminal domain, many hostility and involvement behaviours from the non-criminal domain are considered respondents in that they are clearly dependent upon situational variables or necessitate the participation of another person. Hostility-related responses, for instance, are generally performed under a high degree of arousal and are therefore prone to be erratic (e.g., perpetration of certain violent crimes). Moreover, both hostility and involvement behaviours are frequently dependent upon responses emitted by another individual (e.g., domestic abuse, multiple marriages, etc.). In contrast, the control theme primarily includes behaviours indicative of structure and pre-planning (e.g., post-secondary education,

military). The significant level of cross-situational consistency ascribed to the theme of control is justifiable given the nature of the items of which it is comprised across both criminal and non-criminal domains. Specifically, these behaviours are less dependent upon contextual factors and in a sense, are "brought" to the situation by the offender himself.

The "controlling" offender: A consistent type.

Again, when limiting the analysis to dominant offender types, it was determined that control-type individuals exemplified greater consistency relative to hostile offenders. Interestingly, the controlling offenders displayed a significant degree of cross-situational consistency with respect to both the control and involvement themes (.34 and .30, respectively). This finding stands in contrast to the results yielded from the main analysis, in which a significant degree of consistency was achieved for the control theme exclusively (.36). The results emerging from this sub-analysis are likely a reflection of the compound effect of two moderator variables concurrently acting upon levels of consistency. When the entire offender sample was analyzed, the moderating nature of the behavioural theme was evident (i.e., control-related behaviours were significantly more consistent relative to behaviours encompassed by the other themes). When considering dominant offender-types only, achieved levels of consistency now become a function of both the nature of the behaviour and the type of person performing the behaviour. Given that the involvement theme only demonstrated consistency with the sub-sample of highly controlling offenders suggests that in this particular case, "person factors" (i.e., individuals particularly high on control) are more important in establishing

behavioural consistency with respect to the theme of involvement than the nature of involvement behaviours as such.

The Power of Aggregation: A Myth?

The prediction that aggregation would serve to increase stability/consistency coefficients was not supported. In part, this is likely attributable to a ceiling effect observed in general levels of temporal stability. As discussed, serial homicide offenders are highly ritualized in their crime scene actions, especially as related to signature. Therefore, there is a tendency to adhere to the same behavioural repertoire across crimes, as reflected in the generally elevated stability coefficients. Consequently, the effect of aggregating crimes was insignificant in further increasing stability. In addition, it is possible that the differences in levels of aggregation (i.e., one, versus two, versus three aggregated crimes) were insufficient to exploit the potential advantages of this technique. In the previously cited research conducted by Epstein (1979), aggregation was performed over four and ten situations, respectively. Had it been possible to acquire a sufficiently large sample of extensive crime series, the expected impact of aggregation may in fact have been observed.

Practical Implications

The wealth of support for the temporal stability of serial homicide offenders in the criminal domain lends credibility to techniques of linkage analysis applied in investigative contexts. Furthermore, given the distinctions drawn between operants and respondents and the evidence suggesting that the former tend to display greater stability might enable police to select, in *a priori* fashion, which particular behaviours are more fruitful for linking purposes.

However, results of the present thesis provide only partial support for the consistency of behaviour between an offender's criminal and non-criminal life. Distressingly, this latter assumption in its general form is integral to the practice of criminal profiling as currently implemented. Recall that in the present study, the methodological criterion for stability/consistency was liberal in the sense that these were measured in relative versus absolute terms as typically defined by investigative psychologists. Thus, it is not surprising that the consistency assumption lacks support in the forensic body of literature.

As it currently stands, investigators are inclined to make sweeping generalizations about the validity of cross-situational consistency in the context of offender profiling (Homant & Kennedy, 1998). In order to increase the accuracy of profiling methods, findings from the present research suggest that it will be necessary to set certain parameters on the consistency assumption. For example, whenever possible, it would be advisable for profilers to focus their attention upon behaviours/offenders that are apt to display the highest levels of consistency – namely those actions which are control-related and offenders that appear to be governed by a predominant theme of control. Focusing investigative efforts on such predictors is likely to yield more fruitful outcomes than, for example, relying on hostility-related crime scene actions to predict the background characteristics of an unknown offender.

Limitations

An opportunity sample.

There are certain limitations inherent in the present research, some of which are specifically related to the sample upon which this investigation was based. Ultimately,

the archived sample of homicide offenders/crimes used in the present study is an opportunity sample rather than one derived through random selection. One related drawback is the inclusion of *solved* homicide cases exclusively, thus reducing the generalizability of findings. For example, it may be the case that unsolved serial offences differ substantially in terms of stability and consistency. Indeed, it is possible that unsolved cases are characterized by lower levels of stability/consistency, thereby precluding their ability to be solved in the first place.

A second disadvantage associated with opportunity samples is the inherent lack of ability to directly observe the research situation. As mentioned throughout the thesis, there is likely a lower degree of reliability (or at the very least an inability to gauge the level of reliability) associated with investigative data due to one's inability to engage in the direct observation of crimes. Reliability may be further impeded by the fact that variables are coded by crime analysts for non-research purposes.

Data restrictions.

While the population of serial homicide offenders is limited at the outset, the sample size was restricted nonetheless – especially when additional constraints were imposed upon inclusion criteria for certain sub-analyses (i.e., the identification of dominant offender types). In addition, having to cap the series length at six crimes to maintain an adequate sample of offenders potentially impeded effects of aggregation upon levels of stability and consistency.

The sample of available background characteristics was fairly limited as well (as were crime scene behaviours, to a lesser extent), especially as related to the theme of involvement. As noted earlier in the discussion, it is possible that the small sample of

involvement-related behaviours is merely due to the nature of serial homicide itself. However, it is notable that in spite of all the above data-related limitations, support for stability (and partial support for consistency) was established nonetheless.

Lack of experimental control.

In contrast to the possibilities afforded to personality psychologists, an examination of the situational impact upon behaviour within the forensic domain is particularly limited. Given that one will likely never have the ability to observe crimes directly, a thorough study of contextual factors upon criminal behaviour is largely precluded. In the personality domain, conditional trait theorists (e.g., Wright & Mischel, 1987; Shoda, 1999) argue against defining situational similarity through physical features alone. Rather, they propose a more idiographic approach, whereby an attempt is made (via interview method) to determine the underlying psychological meaning of specific situations to specific individuals. It is only then that one may determine true situational equivalence. Thus, one might expect consistency to emerge across two situations that are psychologically equivalent, yet physically dissimilar. Alison and colleagues (2002) argue for the application of the conditional trait approach to the profiling field. By subjecting offenders to a thorough interview process, they suggest that it may be possible to similarly "assess the psychological relevance of situational properties that might emerge in criminal activity" (p. 125). However, given the difficulty in assessing the physical equivalence of situations in the criminal context (a more objective measure), it would arguably be even more challenging, if not impossible, to establish psychological equivalence. The latter is contingent upon several factors, namely the offender's degree of cooperation and truthfulness. Furthermore, even if the

underlying psychological meaning of situations was established for an individual offender, similar perceptions would likely not generalize to other offenders.

Directions for Future Research

First and foremost, it would be wise to replicate the present study with a larger sample of serial homicide offenders. In particular, access to longer crime series might increase the likelihood of observing the effects of aggregation. Moreover, access to a more diversified sample of behaviours (especially as related to an offender's background characteristics) is also advisable and would potentially allow for more accurate and thorough thematic articulation, especially as related to involvement behaviours. Although underrepresented in serial homicide, it may nonetheless be worthwhile to further elucidate characteristics of this particular theme. It would also be advisable to replicate this study with other serial crimes such as rape, kidnapping, arson and armed robbery in order to determine whether present findings will generalize beyond serial murder.

Despite the aforementioned limitations regarding the study of situational equivalence as related to criminal contexts, it might be feasible to engage in attempts to at least partially increase situational equivalence through the examination of additional moderator variables. For instance, one might wish to consider simple crime categorizations pertaining to offence location (e.g., indoors/outdoors), time of day during which the crime occurred (e.g., day/night), and so forth. In turn, these distinctions might reveal fundamental differences between offenders. For example, an offender who chooses to commit a crime indoors is often considered "low risk" with respect to likelihood of detection (Holmes & Holmes, 1998). Conceivably, this type of individual

might proceed with greater caution in his criminal life and therefore, exemplify greater temporal stability relative to an offender who engages in a greater risk by committing his crimes outdoors.

It may be fruitful to derive different thematic conceptualizations of serial homicide other than those of hostility, control, and involvement. In other words, a different underlying set of motivations might be explored in relation to this crime – perhaps one in which no theme or category is underrepresented. Several interpretive frameworks have been proposed in the forensic literature, which may also be applied to the study serial homicide. For example, Canter and Fritzon (1998) have conceptualized serial arsonists along the dimensions of *person-object* and *instrumental-expressive*. In relation to homicide, person-object might relate to the degree of which the offender personalizes his victim (versus simply using the victim as a "prop"). Instrumental-expressive, on the other hand, might relate to the extent that the offence is impulsive or emotionally charged (versus calculated and thoughtfully directed towards a particular target).

Given access to offenders housed within correctional facilities, it would also be worthwhile to conduct a formal personality assessment related to the themes of hostility, control, and involvement. In doing so, one may be able to determine whether these personality measures actually correspond to results based on behavioural indices of the above themes. There is a criticism raised in the profiling literature regarding a "missing link" between the study of an offender's crime scene behaviour and his background characteristics, the latter typically consisting of demographics (e.g., criminal record, age, occupation, etc.) (e.g., Alison et al., 2002). An inferential leap is then taken whereby

personality "traits" are ascribed and assumed to intercede between these two domains. Through the administration of personality inventories related to the above constructs, one may then be able to bridge this gap and determine whether genuine personality measures actually cohere with profiling-based predictions.

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Appendix A

Glossary of Offender Background Variables

Alcdrugtx (alcohol or drug treatment)

- As a juvenile or adult, the offender was treated for alcohol or drug abuse.

Burglary (burglary)

- Includes any charges (whether or not they were later dropped) and/or convictions received by the offender for burglary, theft, or robbery.

Church (church member)

- Offender was an active member of a Christian church.

Divorce (divorced)

- At the time of the arrest, the offender's marital status was "divorced".

Domestic (domestic abuse)

- Includes any police reports, criminal charges and/or convictions received by the offender related to the perpetration of domestic abuse.

Drugoff (drug offences)

- Any drug-related charges and/or convictions received by the offender.

Entrepreneur (entrepreneur)

- At the time of the arrest, the offender was self-employed (i.e., running his own business).

Fetish (fetishism)

- Offender gains sexual pleasure by interacting with specific body parts and/or by replacing a human sexual partner with objects.

Fraud (fraud and forgery)

- Includes any charges (whether or not they were later dropped) and/or convictions received by the offender for fraud or forgery.

Juvrecord (juvenile record)

- Offender incurred criminal charges of any kind (whether convicted or dismissed) prior to the age of 18.

Military (military or armed forces)

- Offender spent some time in military service. This was recorded whether the offender received an honourable or dishonourable discharge. No particular branch of service is specified.

Multmarriage (multiple marriages)

- Offender was married at least twice.

Parole (parole status)

- At the time of arrest, the offender was either on parole or probation.

Pedophile (pedophilia)

- Offender engages in sexual relations with a male or female child under sixteen years of age.

Porn (pornography)

- Offender reads and collects a variety of pornographic material (e.g., books, videotapes, etc.).

Postsecondary (post-secondary education)

- Offender has received some post-secondary education.

Psychiatric (psychiatric history)

- As a juvenile or adult, the offender displayed symptoms of or was treated for mental health problems (not including drug or alcohol abuse).

Sport (sports involvement)

- Offender was an avid sportsman or outdoor enthusiast.

Suicide (suicide attempt(s))

- Offender has a history of at least one suicide attempt as suggested by any police, medical, or psychiatric reports.

Unemployed (unemployed)

- At the time of the arrest, the offender was unemployed (i.e., not working at a legally held job).

Violent (violent criminal history)

- Includes any charges (whether or not they were later dropped) and/or convictions received by the offender for violent crime (i.e., murder, attempted murder, rape, attempted rape, kidnapping, attempted kidnapping).

Voyeur (voyeurism)

- Offender has a history of voyeurism based on prior convictions and/or psychiatric reports (i.e., reports of "peeping tom").

Appendix B

Glossary of Crime Scene Variables

Addbook (address book)

- Offender used victim's address book to make contact with future victims.

Blitz (blitz attack)

- Sudden and immediate perpetration of violence, which incapacitates the victim. May or may not be preceded by a con or ruse.

Bodybury (body buried)

- Victim's body found completely buried in the ground such that no part of the corpse was visible. This does not include the victim's body being covered by some article.

Bodyhide (body hidden)

- Victim's body was found hidden – i.e., could not be viewed with ease and/or visibility was obstructed by trees or other barriers. This does not include burial of the victim's body.

Bodymove (body moved)

- Victim's body was moved from the scene of attack or murder to the ultimate disposal site, either by foot or by vehicle.

Bludgeon (bludgeoning)

- Offender stuck the victim with a blunt instrument (e.g., tire iron).

Bound (victim bound)

- Victim was bound at some point during the attack by an article such as rope, tape, cord, handcuffs, etc.

Cannibal (cannibalism/drinking blood)

- Offender engaged in cannibalism (i.e., eating victim's flesh) and/or drinking the victim's blood.

Captive (captivity)

- Offender held the victim captive for more than eight hours prior to the murder.

Choked (choked)

- Offender choked the victim to death.

Con (con approach)

- Offender initiated contact with the victim prior to the attack through the use of a con approach. This would include any verbal contact, pseudo introductions, fabricated stories, etc.

Crimekit (crime kit)

- Offender possessed a crime kit for torturing victims. This kit might include items to bind the victim (e.g., tape, rope) and/or devices by which to submit the victim to sadistic torture (e.g., electrical devices, pliers).

Destevid (destroyed evidence)

- Offender destroyed or attempted to destroy physical evidence at the crime scene. This may involve wiping or washing the victim, removal of incriminating articles from the scene, etc. However, this does not include simply wearing gloves as this is common practice among most criminals.

Destproperty (destruction of property)

- Offender destroyed or attempted to destroy property at the crime scene (e.g., vandalizing, burning, etc.).

Diary (diary)

- Offender maintained a written or taped account of the murders. This would include the saving of newspaper clippings pertaining to the murders.

Facecover (victim's face covered)

- Use of any physical article to cover the victim's entire head at any point during the attack.

Fistclub (fist or club)

- Offender's method of attack was with hand, fist, or clubbing weapon.

Forced (forced entry)

- Offender entered the victim's home by force. This includes prying windows and doors, as well as breaking locks and windows. This does not include the perpetration of physical force against the victim.

Gag (gagging)

- Placement of any physical article placed around the victim's mouth at any point during the attack. This does not include manual gagging.

Manual (manual attack)

- Offender's method of attack was manual (e.g., hitting, choking, etc.).

Multiviolence (multiple violence)

- Offender perpetrated multiple forms of extreme violence against the victim (e.g., two or more of stabbing, shooting, choking, bludgeoning).

Muliweapon (multiple weapons)

- Offender used multiple weapons (i.e., physical instruments) to perpetrate the murder (i.e., two or more of firearm, knife, club, ligature, etc.).

Night (night entry)

- Entry into the victim's home was during the night (i.e., between sunset and sunrise).

Offhome (body found in offender's home)

- Victim's body was discovered at the offender's home.

Oraltooff (oral sex to offender)

- Victim performed oral sex on the offender.

Oraltovic (oral sex to victim)

- Offender performed oral sex on the victim.

Photo (photographs)

- Offender photographed and/or videotaped the victim prior to or after death.

Pose (victim posed)

- Offender intentionally positioned the victim's corpse, such as one would do for a photograph.

Postdis (post-mortem dismemberment)

- Offender hacked or chopped off victim's body parts post-mortem.

Postsex (post-mortem sex)

- The offender engaged in necrophilic acts with the victim's corpse.

Preinjure (pre-mortem injuries)

- Offender inflicted pre-mortem injuries upon the victim.

Preweapon (weapon pre-selected by offender)

- Offender pre-selected a weapon and brought it to the crime scene.

Ransack (ransacked property)

- The tearing apart of the victim's personal belongings at the crime scene, including the victim's clothing.

Redress (victim redressed)

- Offender redressed the victim's body after the murder.

Restrain (restraints brought by offender)

- Restraints were brought to the crime scene by the offender.

Ruse (ruse)

- Offender initiated contact with the victim prior to the attack through a subterfuge or trick. This includes assuming a role, such as faking a broken leg or arm.

Stab (stabbed)

- Offender's method of attack was stabbing.

Stole (victim's belongings stolen)

- Offender took items from the victim other than clothing (e.g., jewelry).

Torture (torture)

- Offender performed sadistic acts upon the victim pre-mortem (e.g., cutting, electric shock, flagellation, more than ten stab wounds inflicted pre-mortem). This also includes mental torture such as forcing the victim to write a letter to loved ones prior to death.

Trophy (trophies)

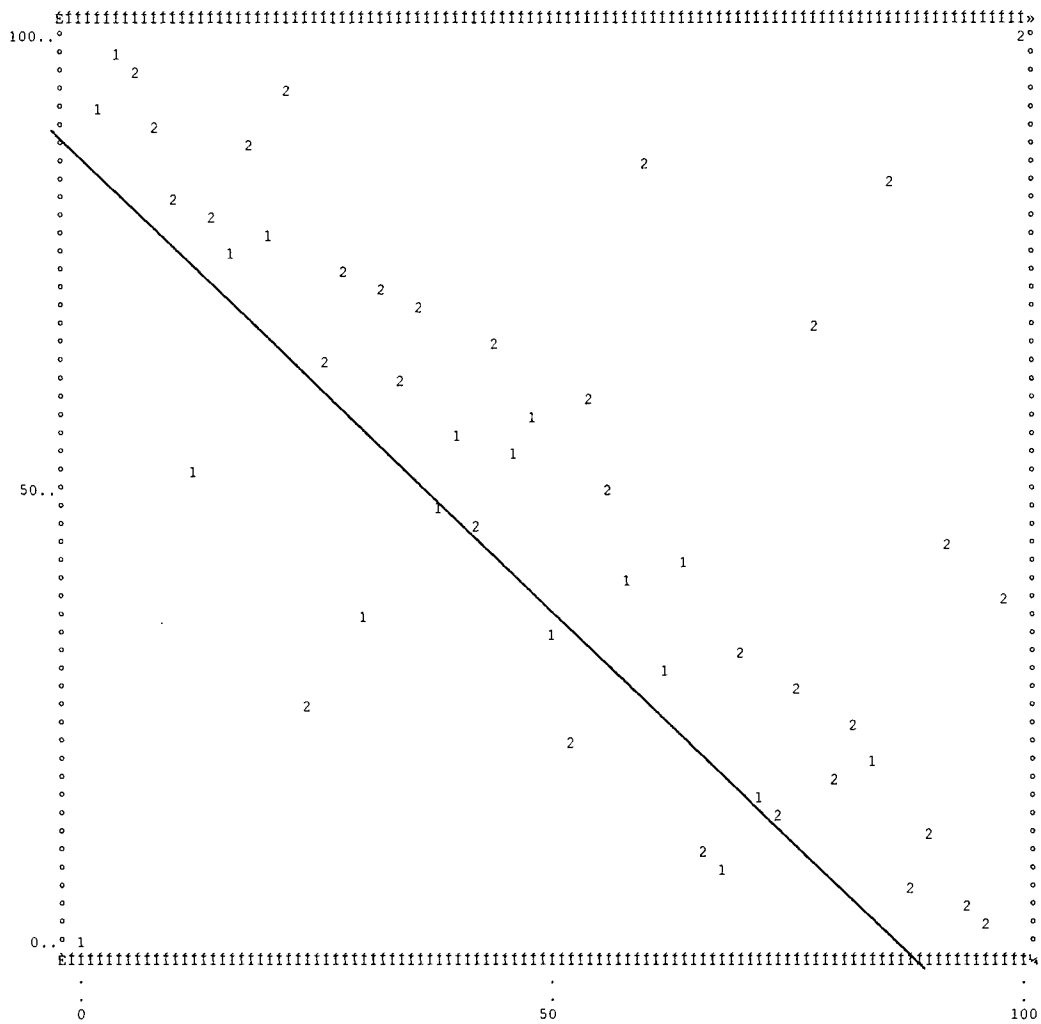
- Offender retained personal items or body parts of the victim.

Appendix C

POSA Item Plots

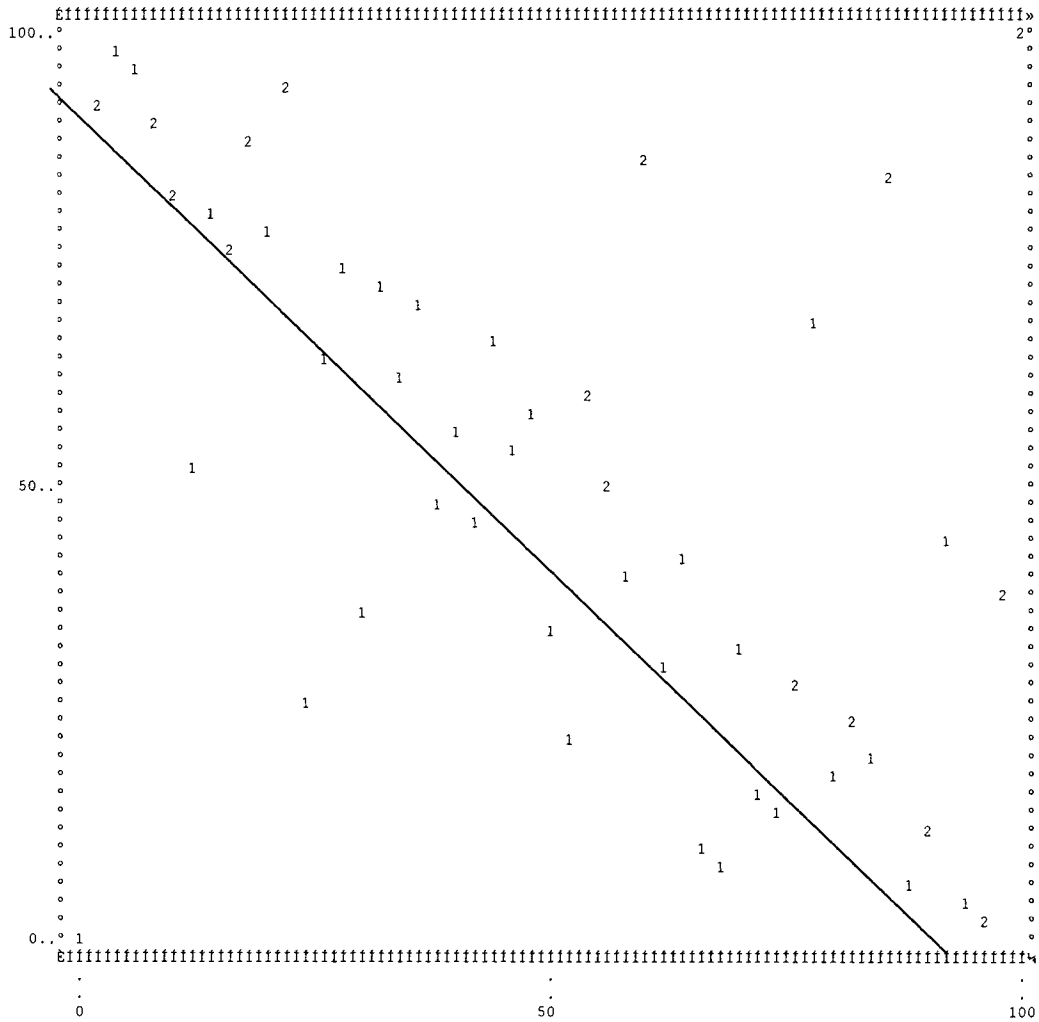
Item plots: Background – hostility.

Item Plot: BURGLARY



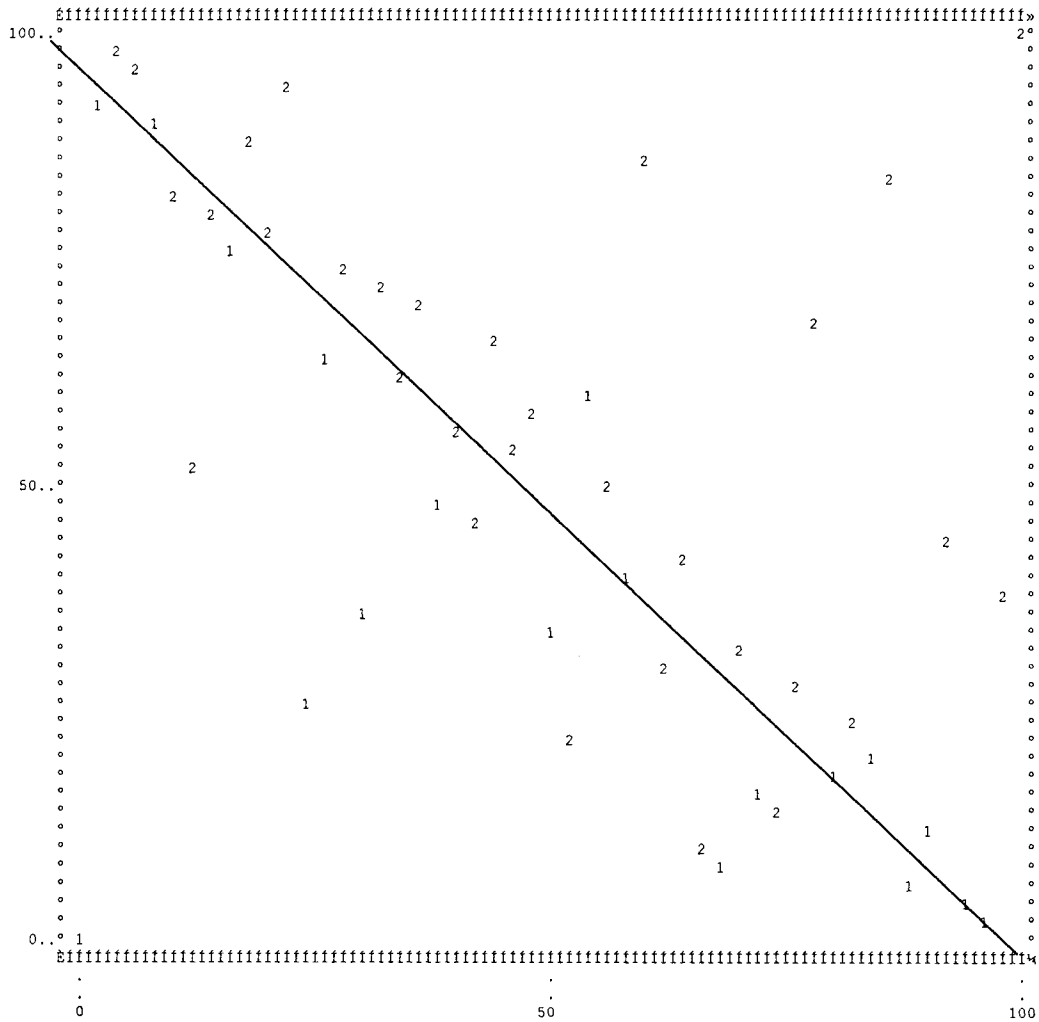
Coefficient of weak monotonicity: .76 (J-axis)

Item Plot: DRUGOFF



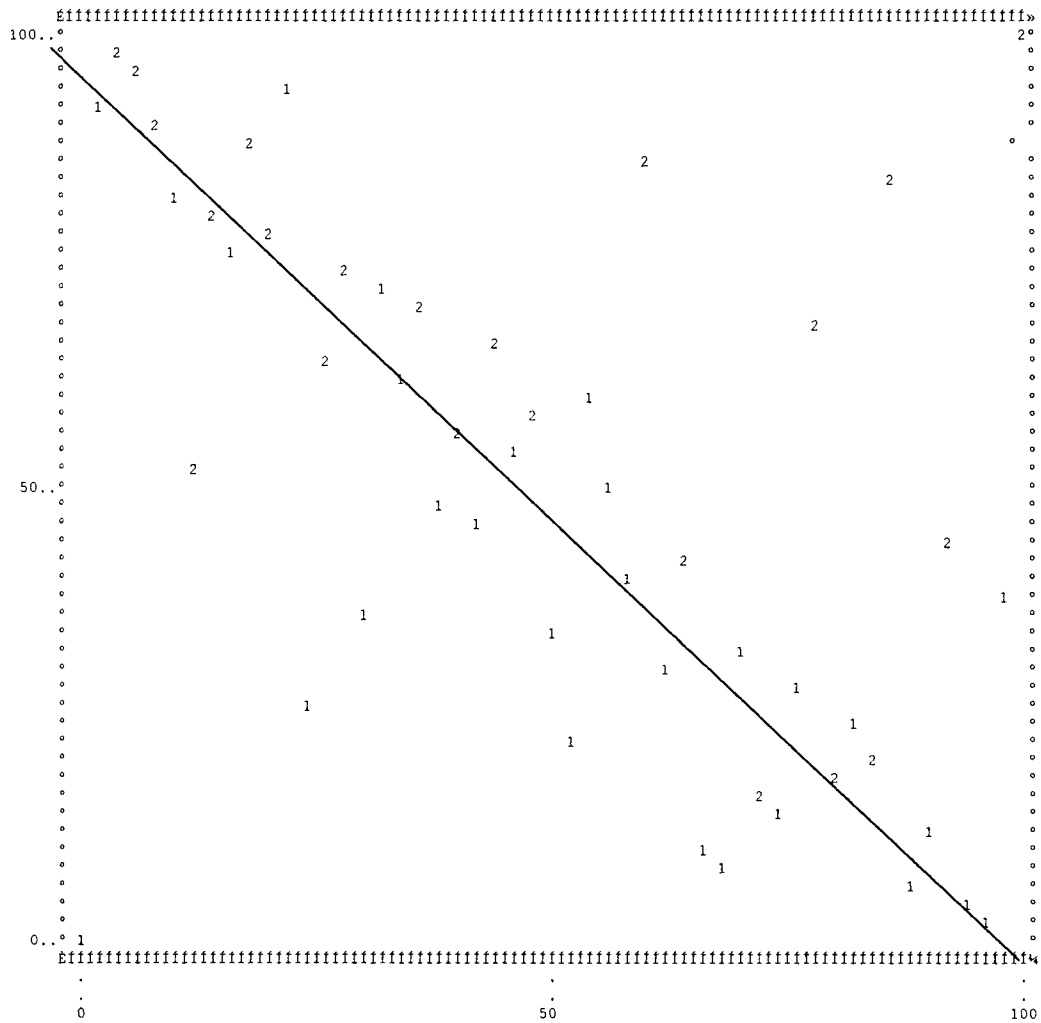
Coefficient of weak monotonicity: .82 (J-axis)

Item Plot: JUVRECORD



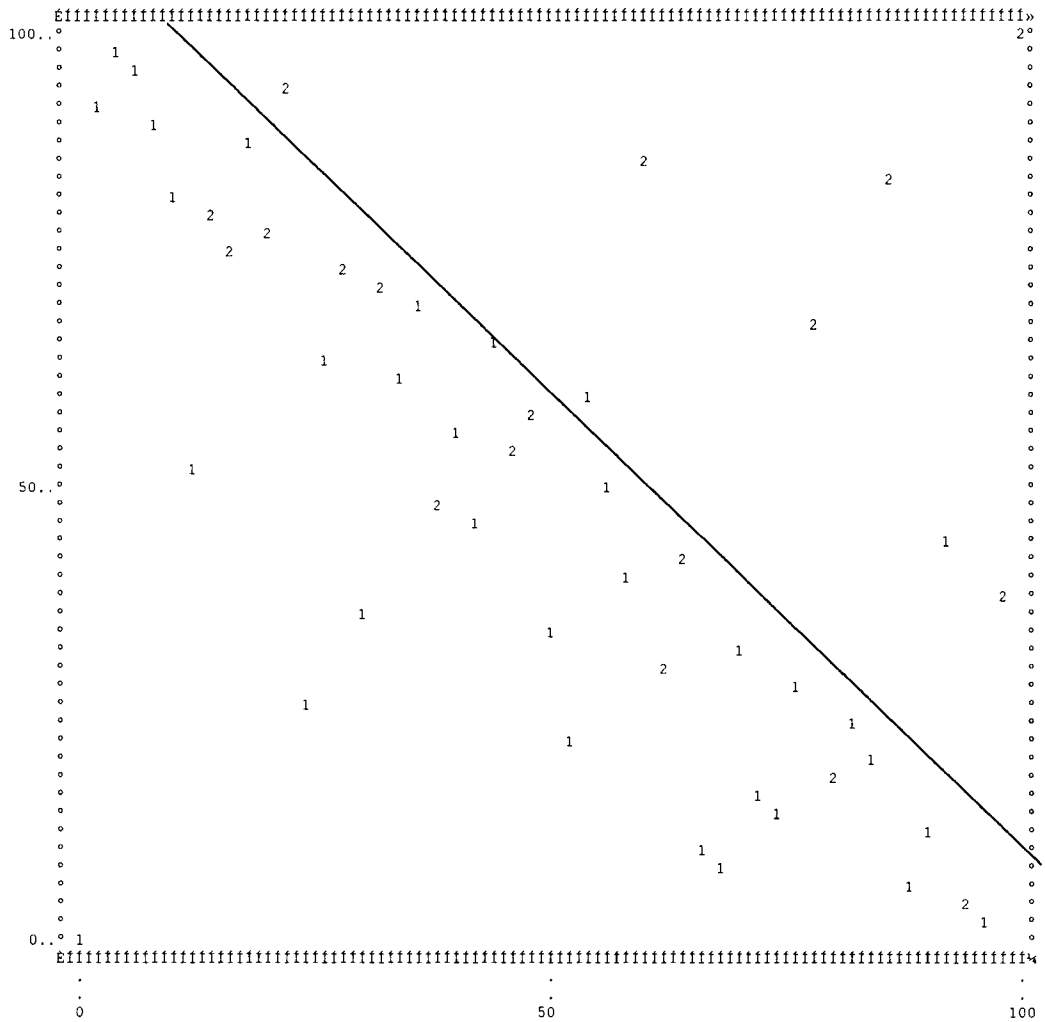
Coefficient of weak monotonicity: .79 (J-axis)

Item Plot: PSYCHIATRIC



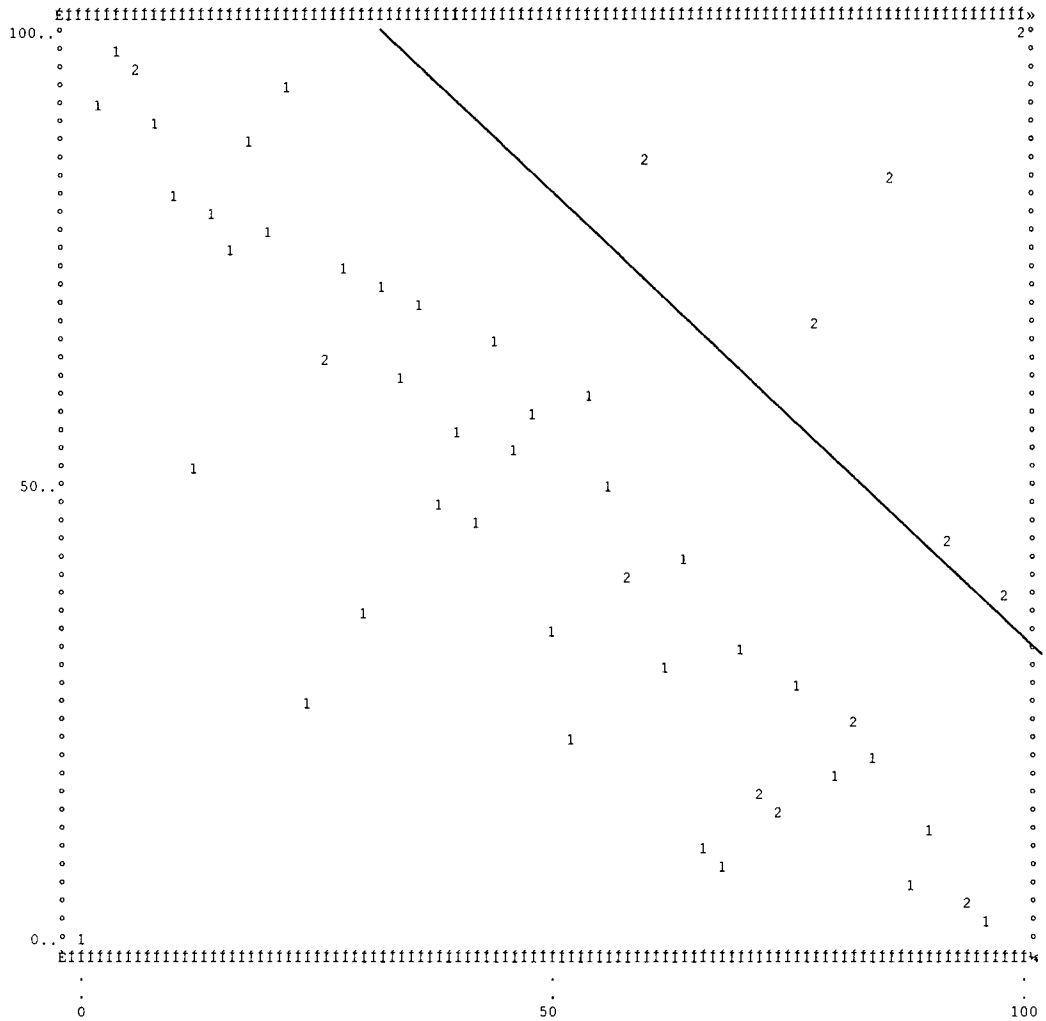
Coefficient of weak monotonicity: .73 (J-axis)

Item Plot: VIOLENT



Coefficient of weak monotonicity: .81 (J-axis)

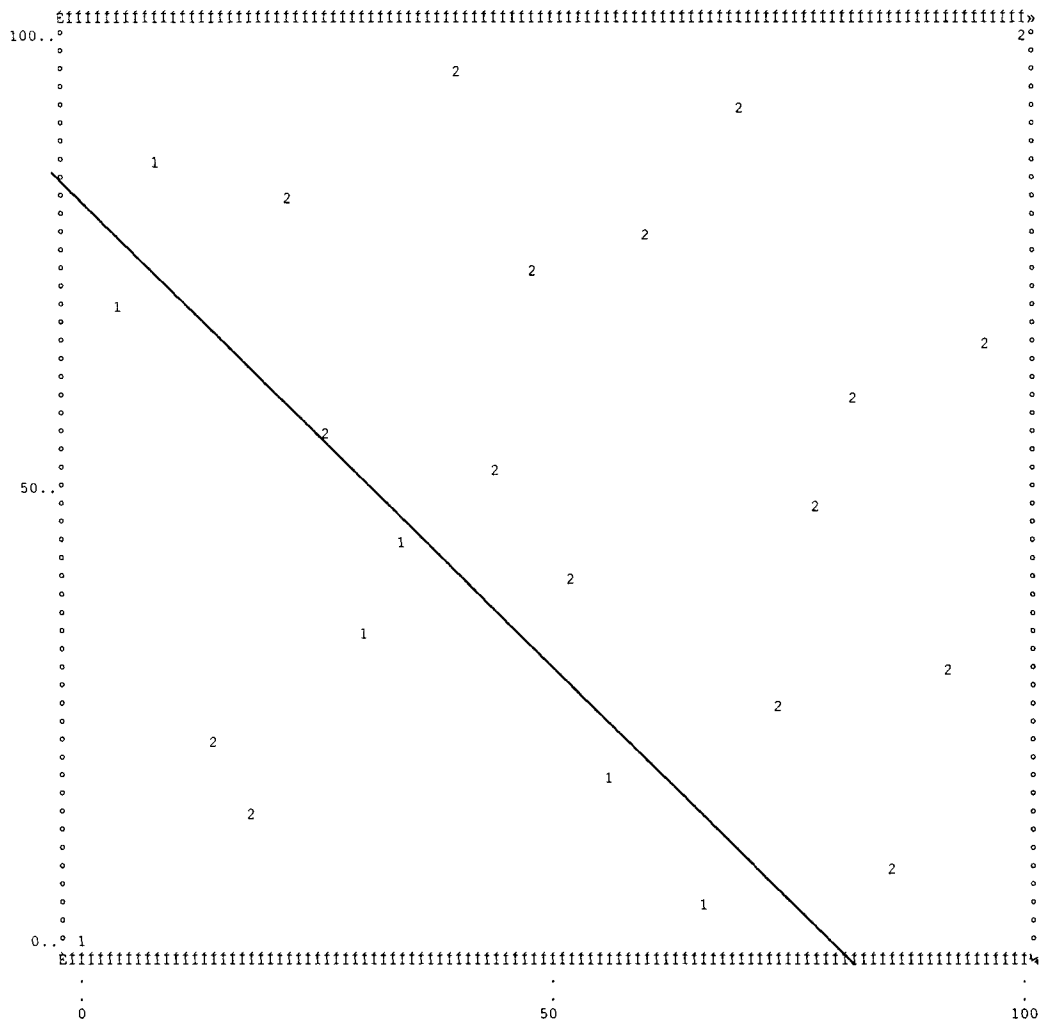
Item Plot: DOMESTIC



Coefficient of weak monotonicity: .85 (J-axis)

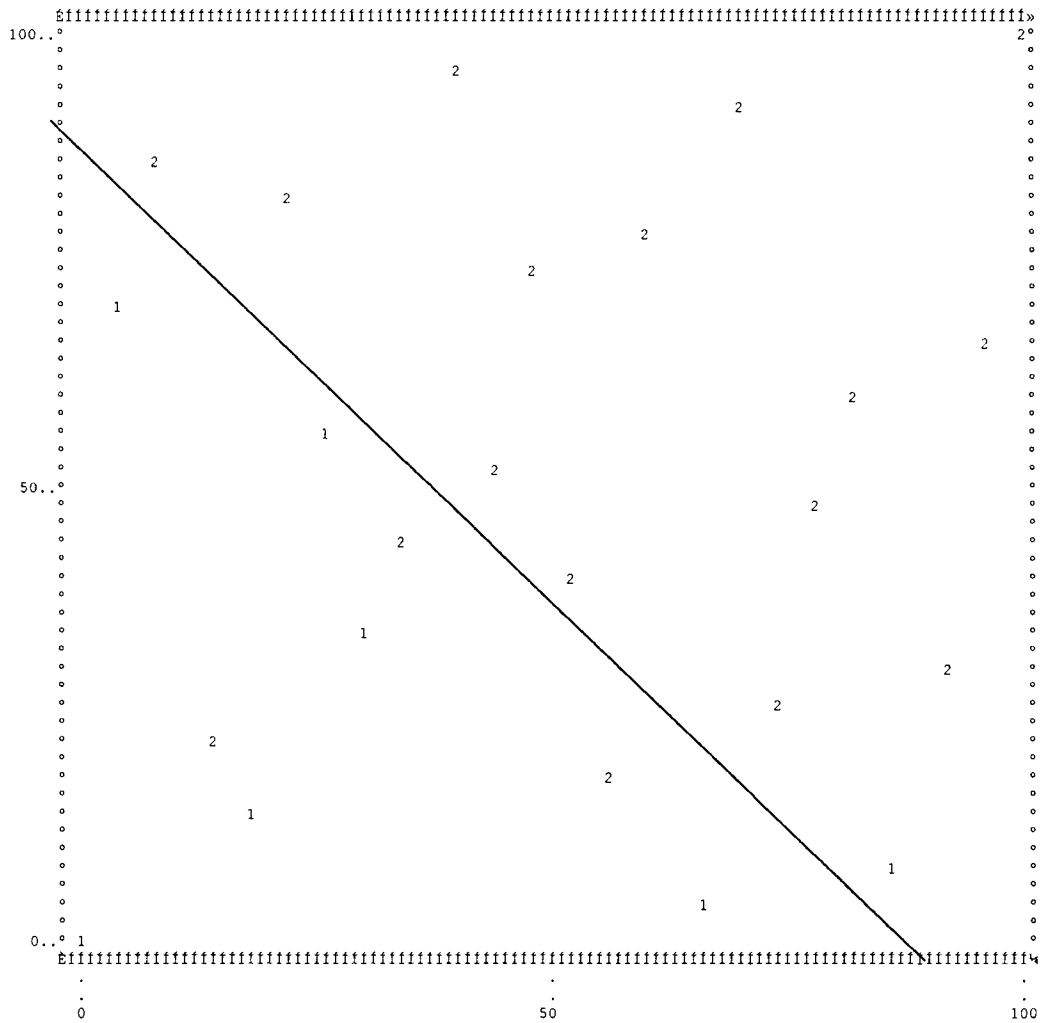
Item plots: Background – control.

Item Plot: PORN



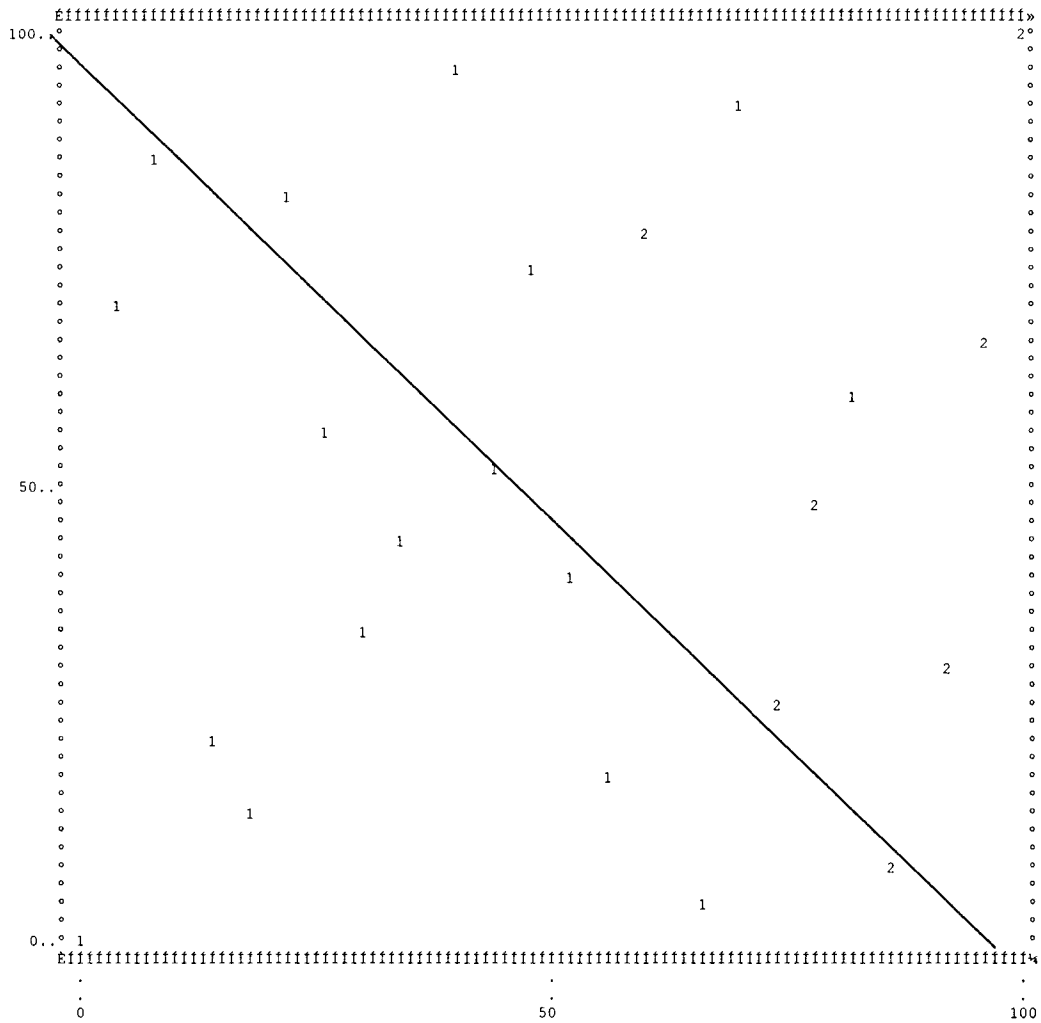
Coefficient of weak monotonicity: .84 (J-axis)

Item Plot: FETISH



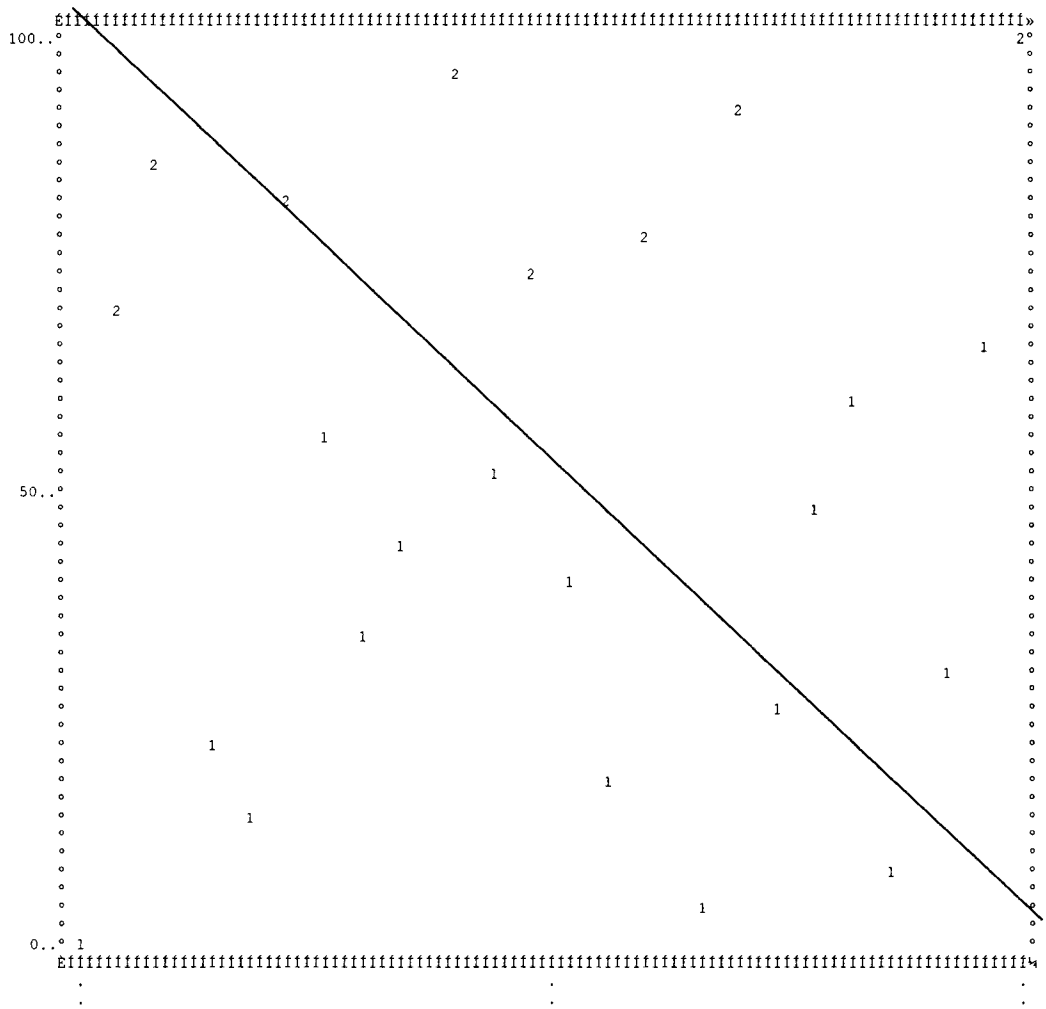
Coefficient of weak monotonicity: .93 (J-axis)

Item Plot: POSTSECONDARY



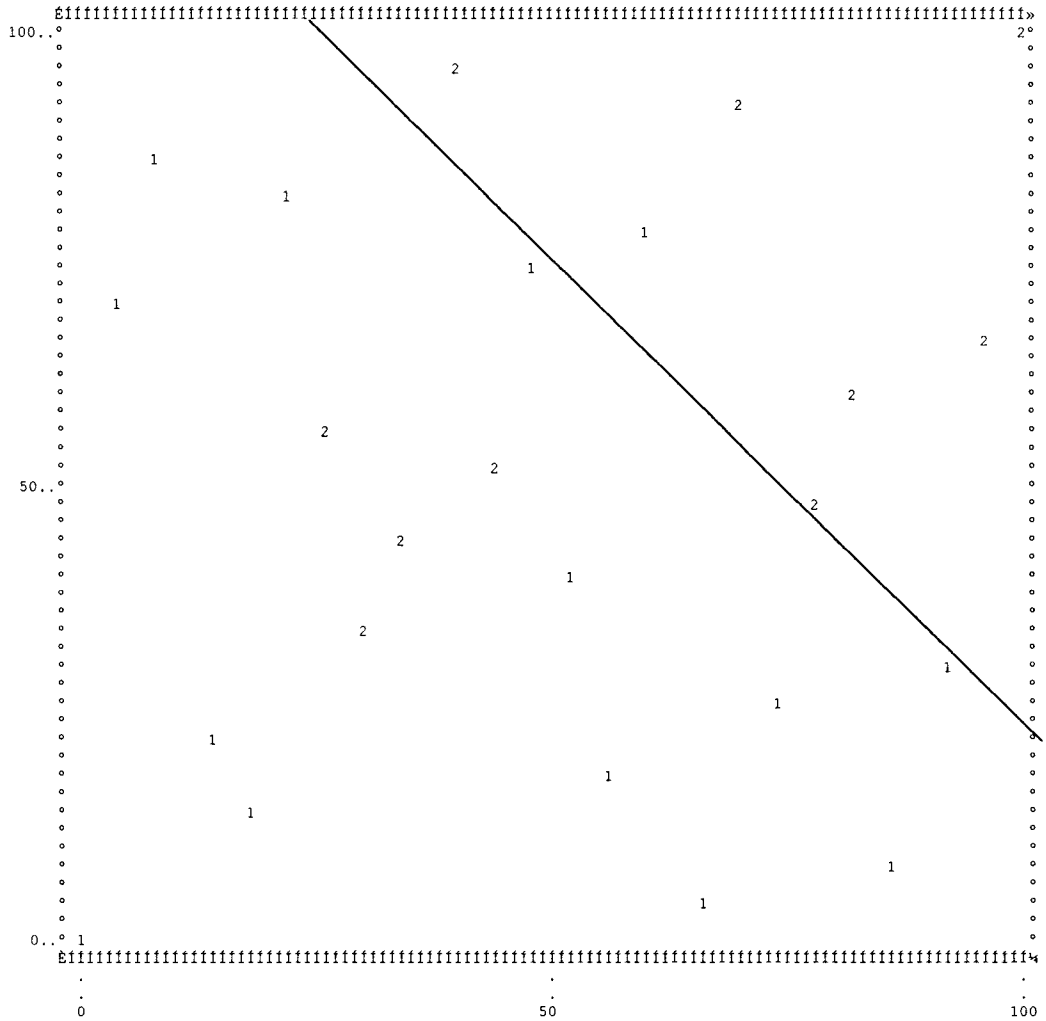
Coefficient of weak monotonicity: .85 (J-axis)

Item Plot: PEDOPHILE



Coefficient of weak monotonicity: .78 (J-axis)

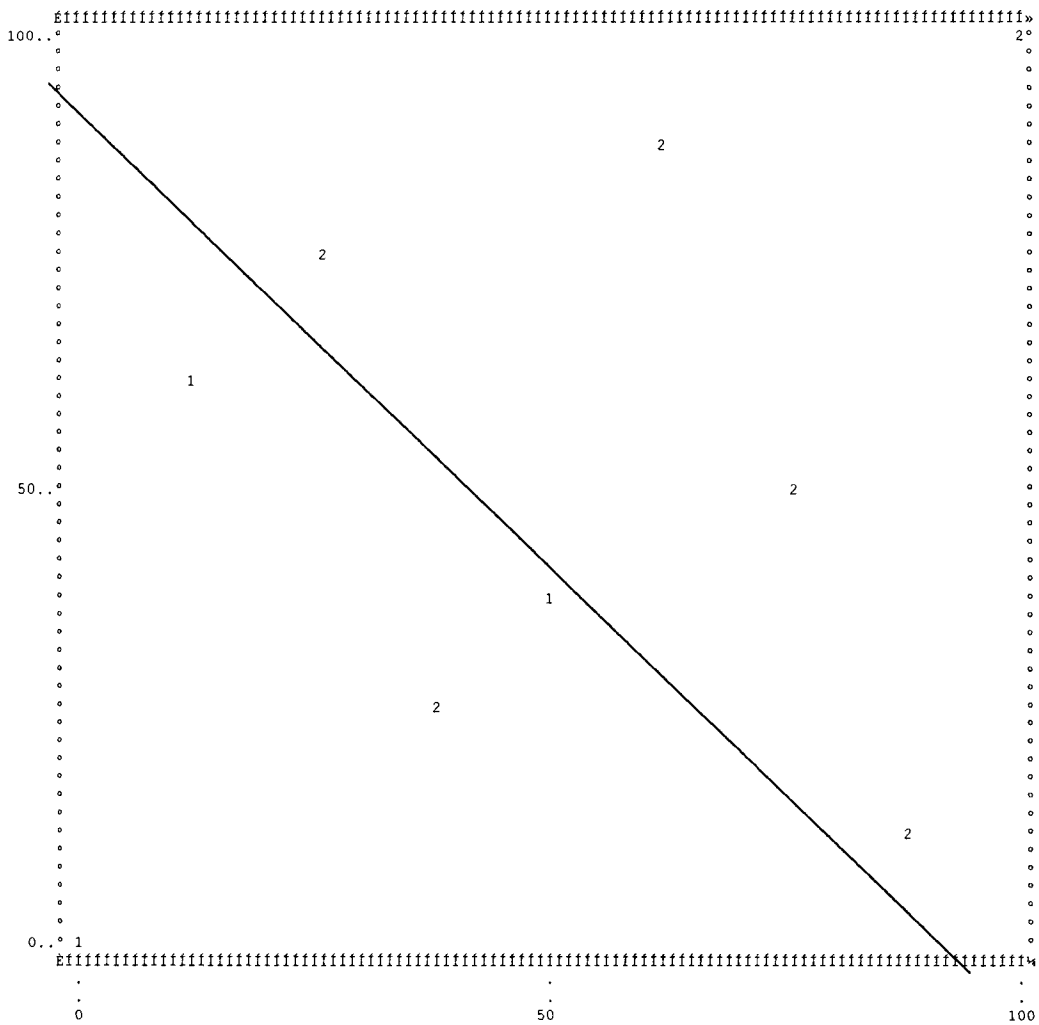
Item Plot: MILITARY



Coefficient of weak monotonicity: .76 (J-axis)

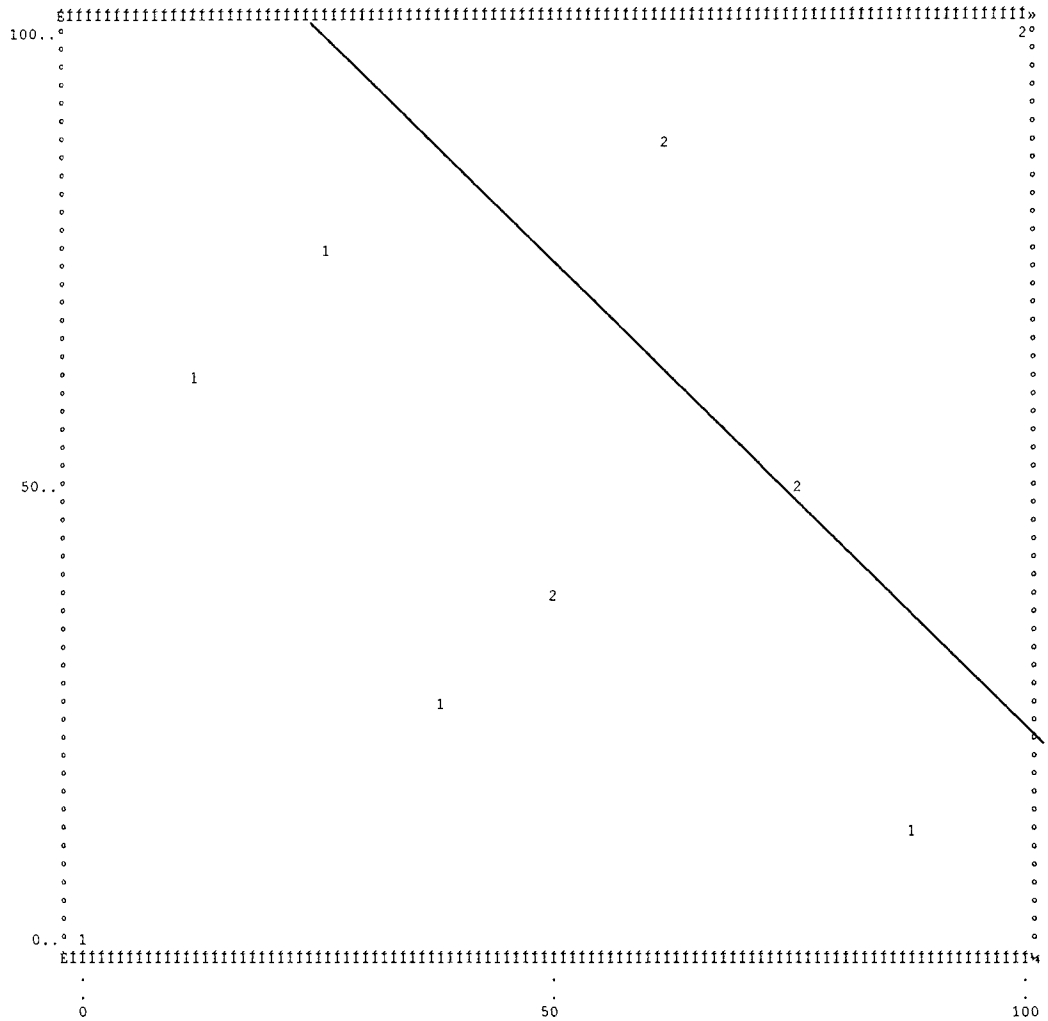
Item plots: Background – involvement.

Item Plot: ENTREPRENEUR



Coefficient of weak monotonicity: .94 (J-axis)

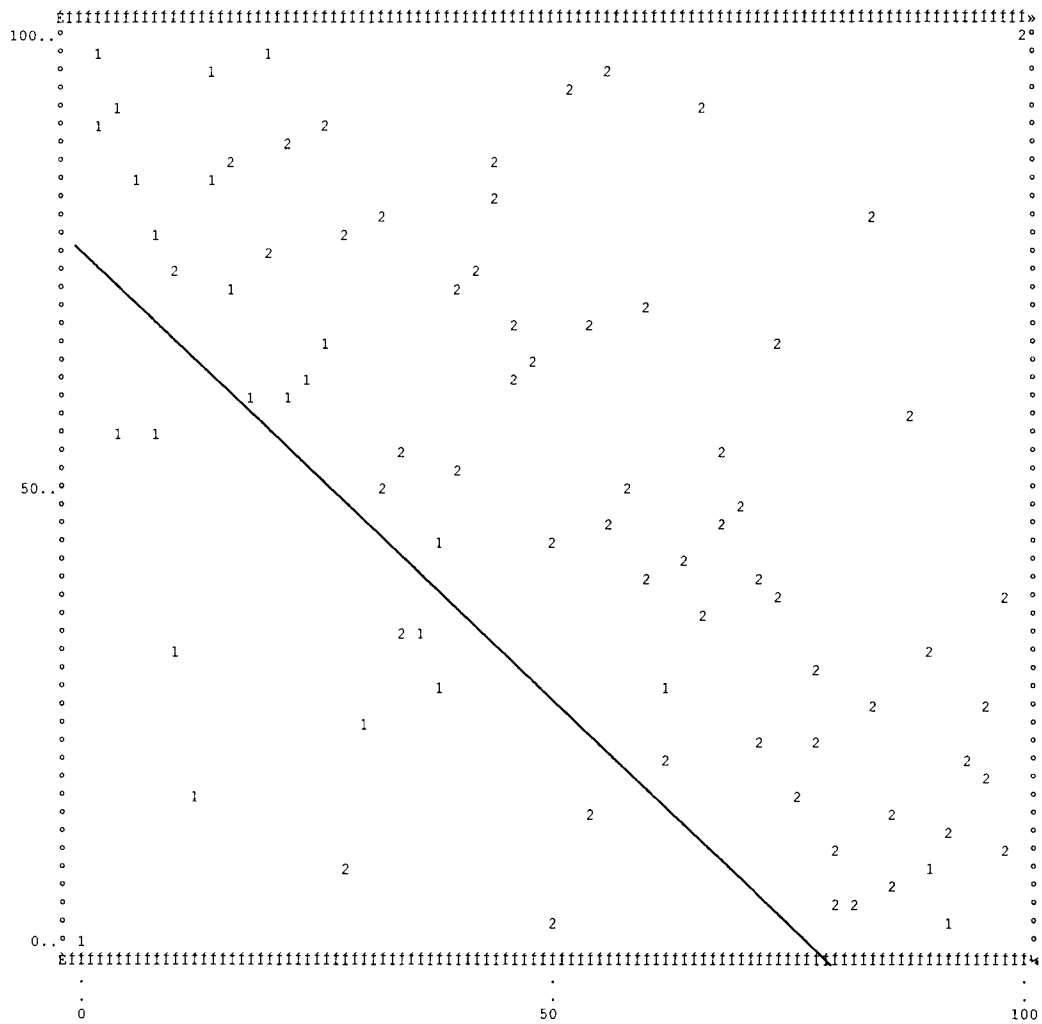
Item Plot: CHURCH



Coefficient of weak monotonicity: .97 (J-axis)

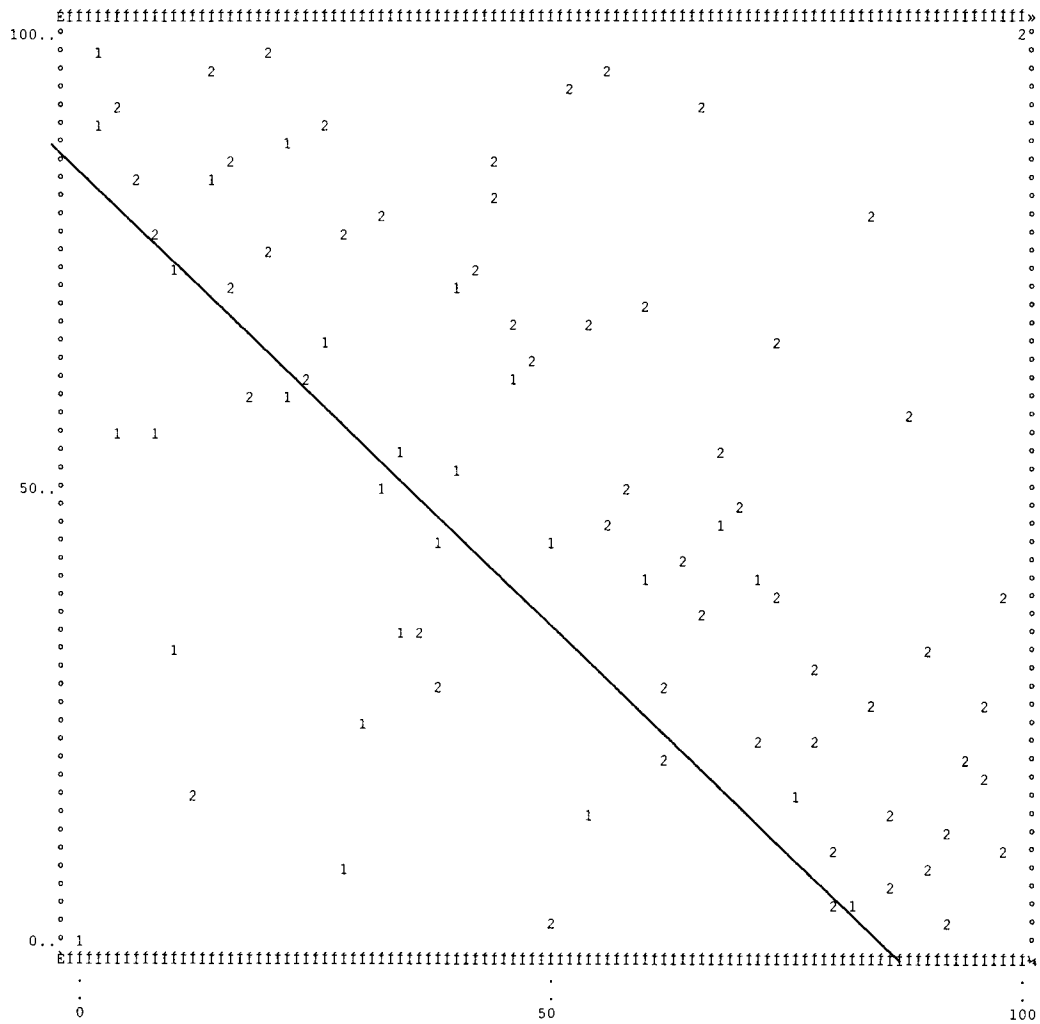
Item plots: Crime scene – hostility.

Item Plot: STOLE



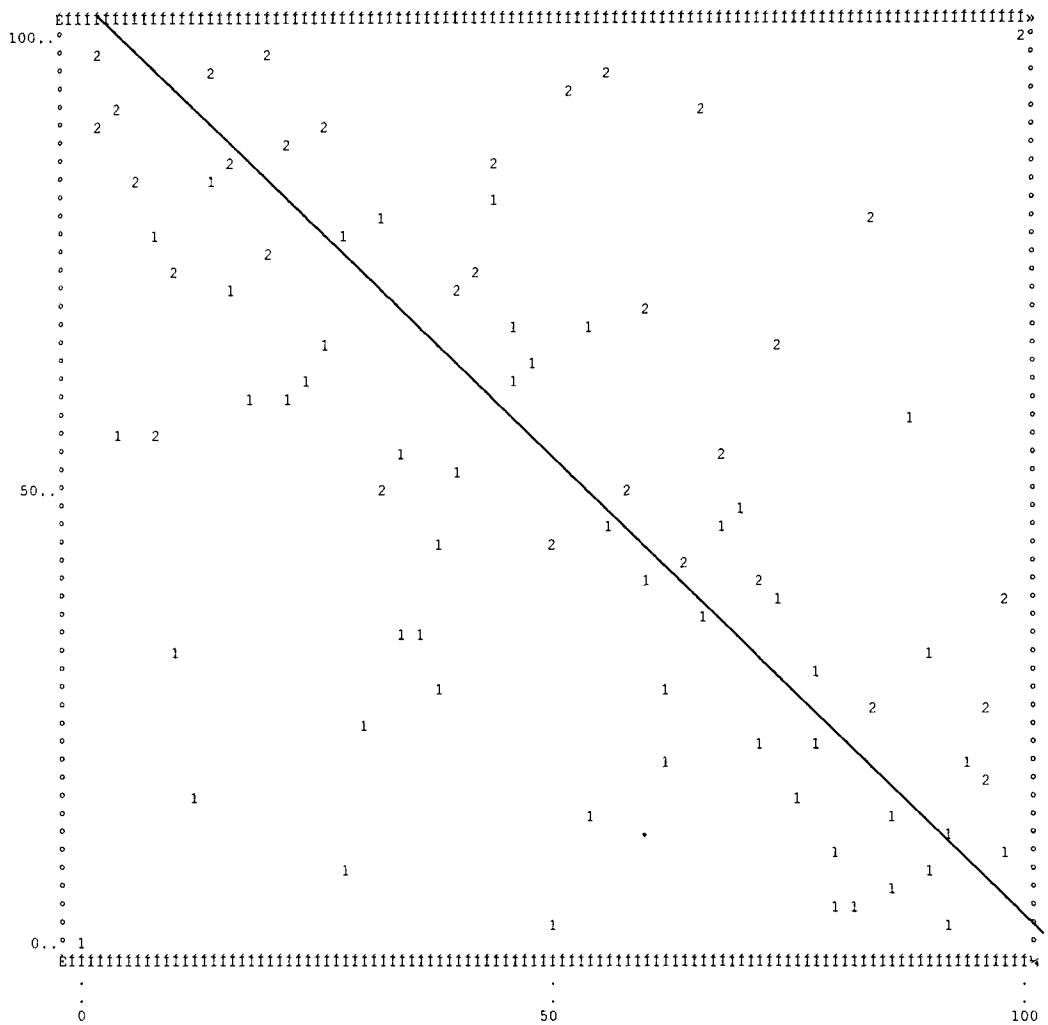
Coefficient of weak monotonicity: .84 (J-axis)

Item Plot: BLITZ



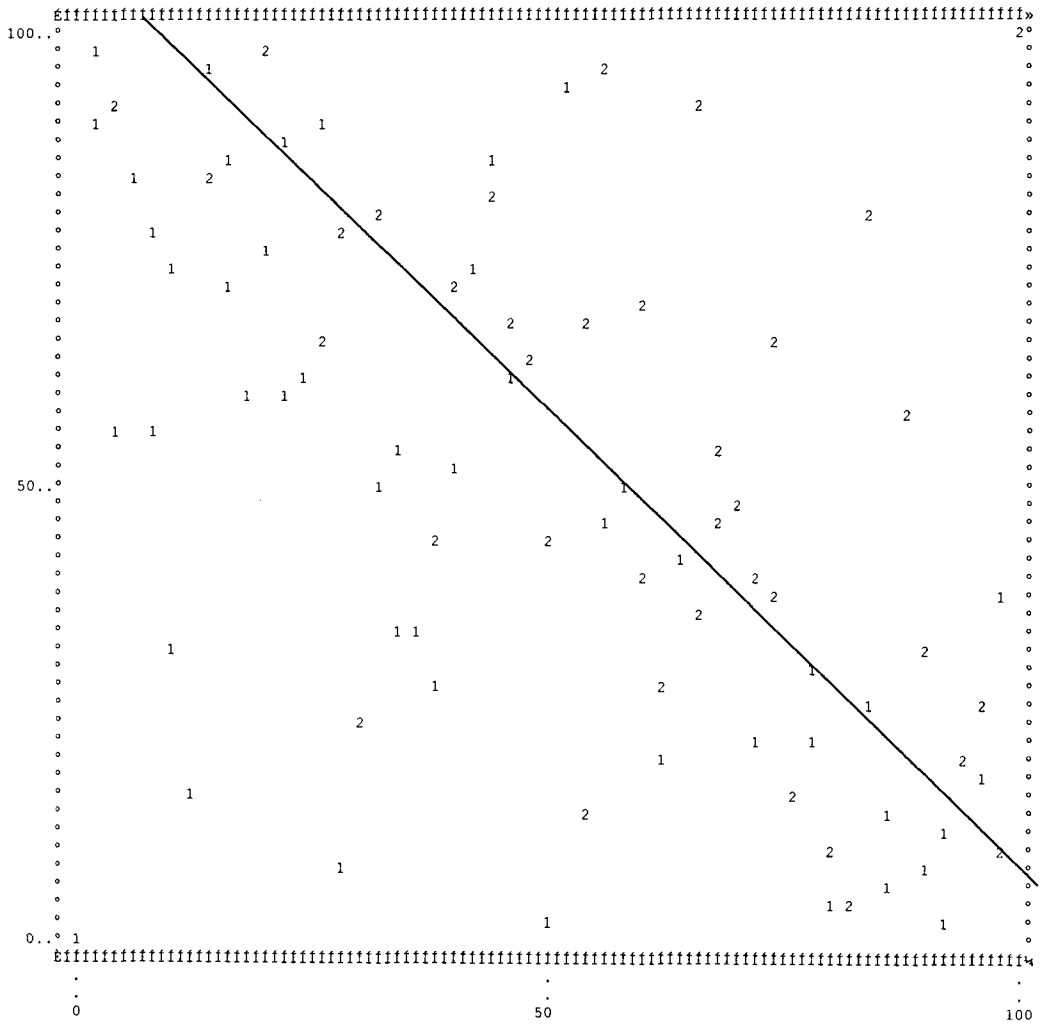
Coefficient of weak monotonicity: .77 (J-axis)

Item Plot: FISTCLUB



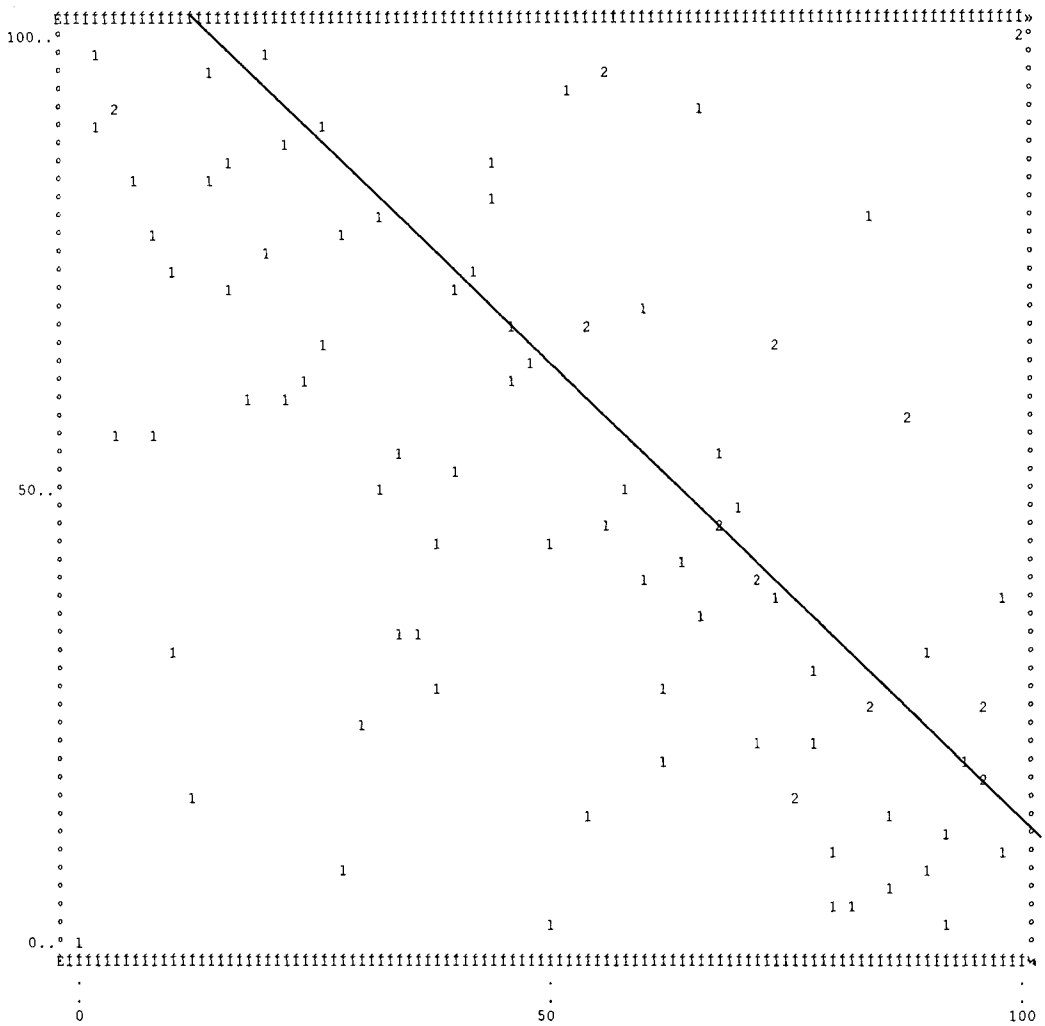
Coefficient of weak monotonicity: .77 (J-axis)

Item Plot: MULTIWEAPON



Coefficient of weak monotonicity: .71 (J-axis)

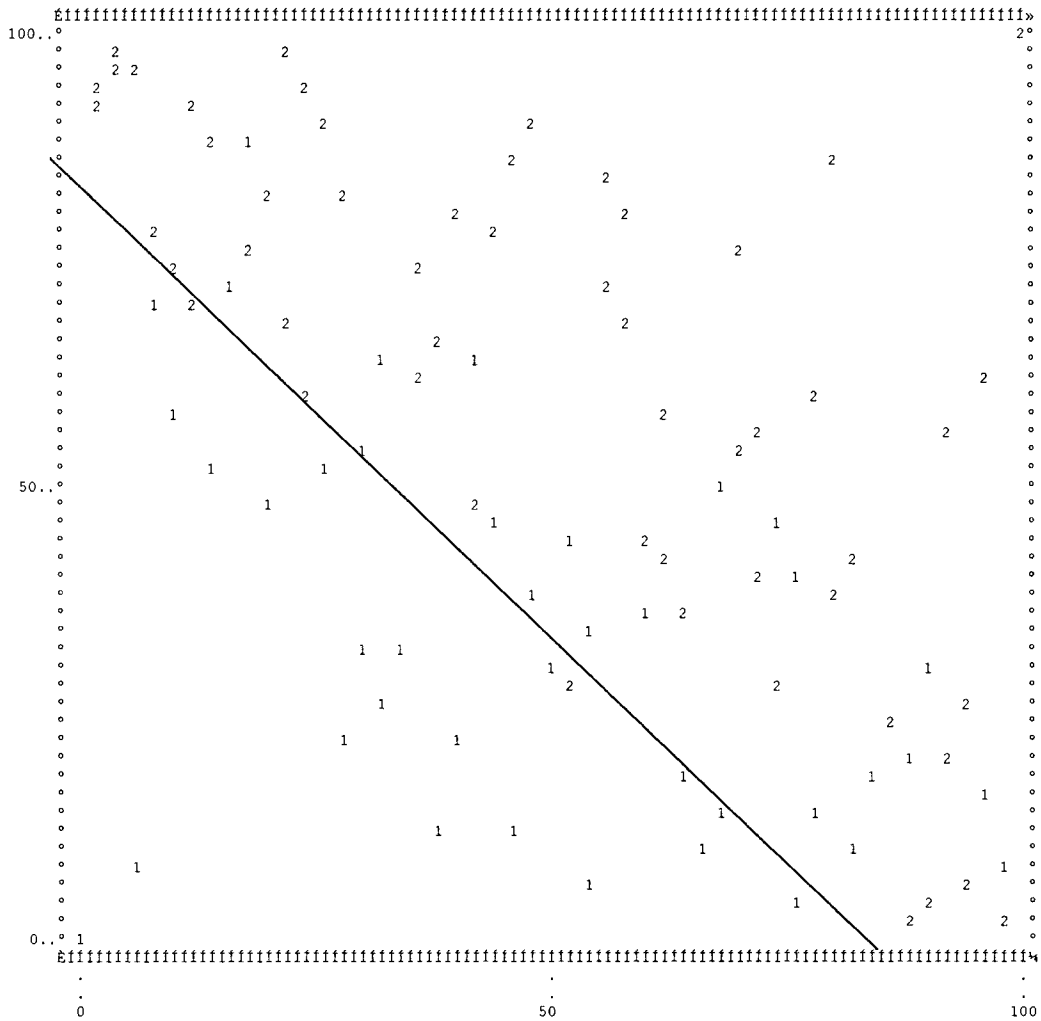
Item Plot: BLUDGEON



Coefficient of weak monotonicity: .82 (J-axis)

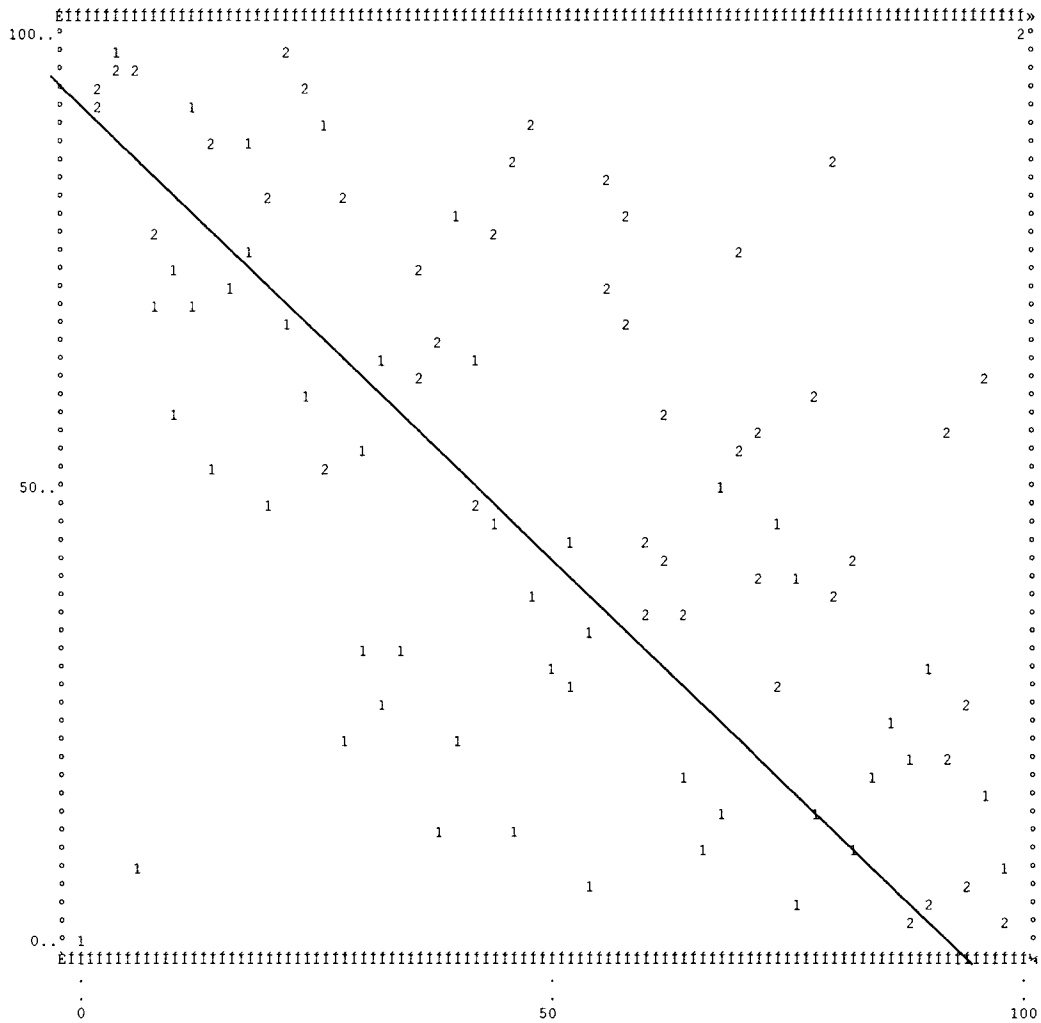
Item plots: Crime scene – control.

Item Plot: BOUND



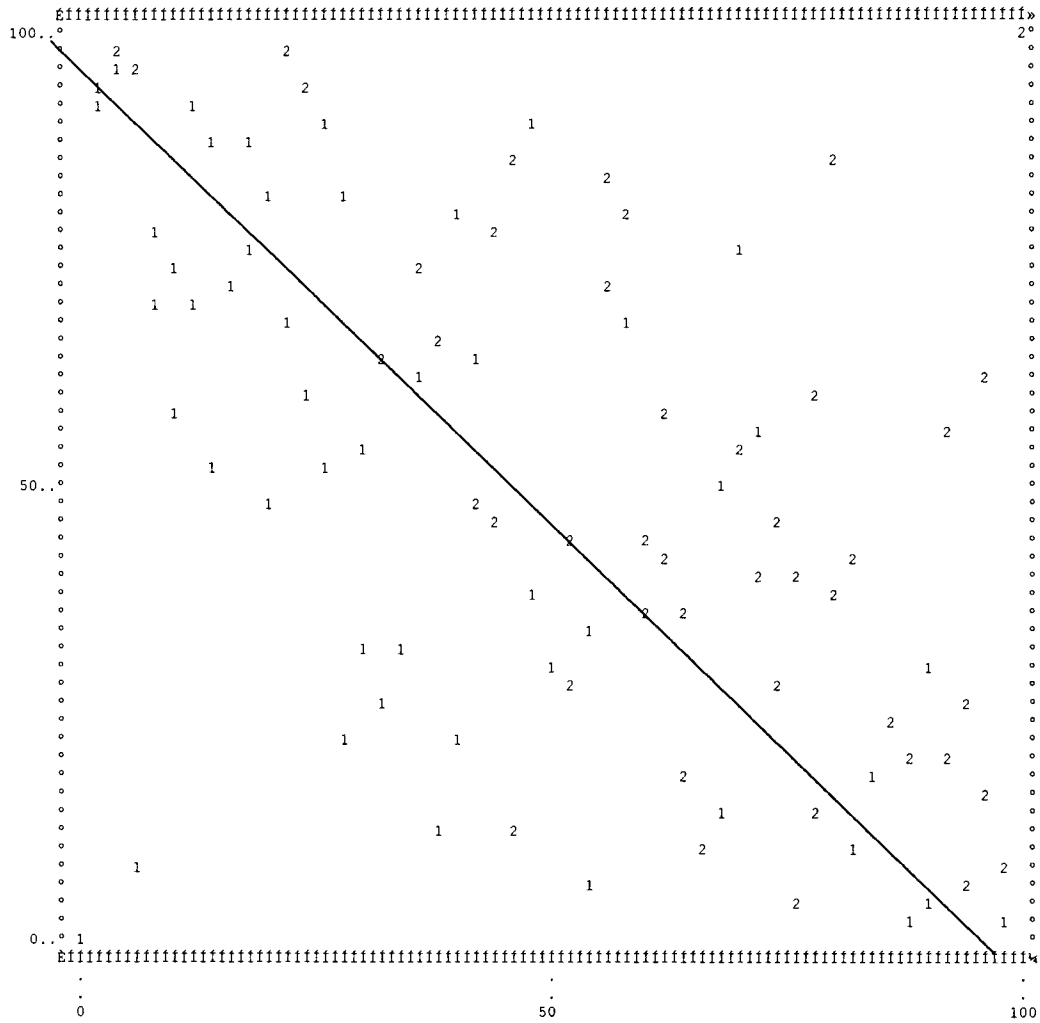
Coefficient of weak monotonicity: .88 (J-axis)

Item Plot: RESTRAIN



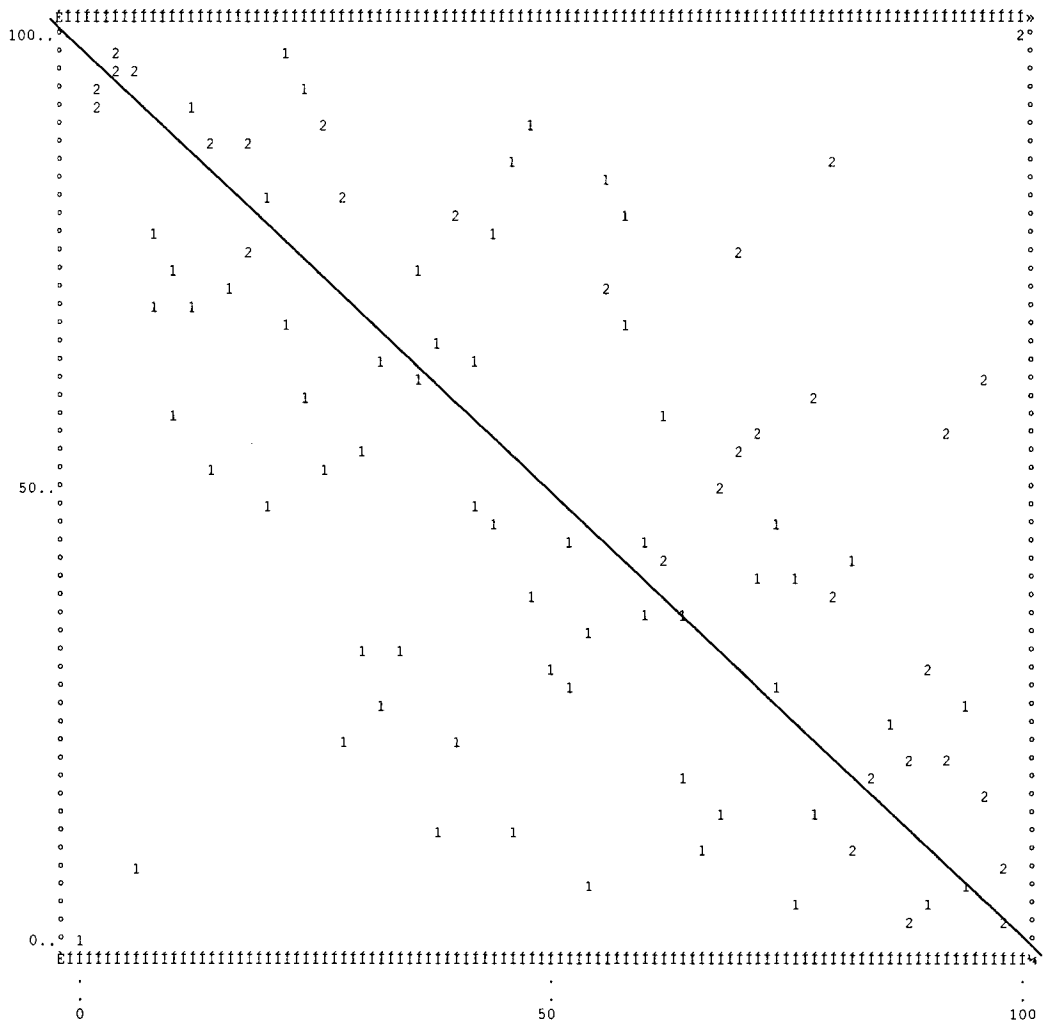
Coefficient of weak monotonicity: .88 (J-axis)

Item Plot: BODYMOVE



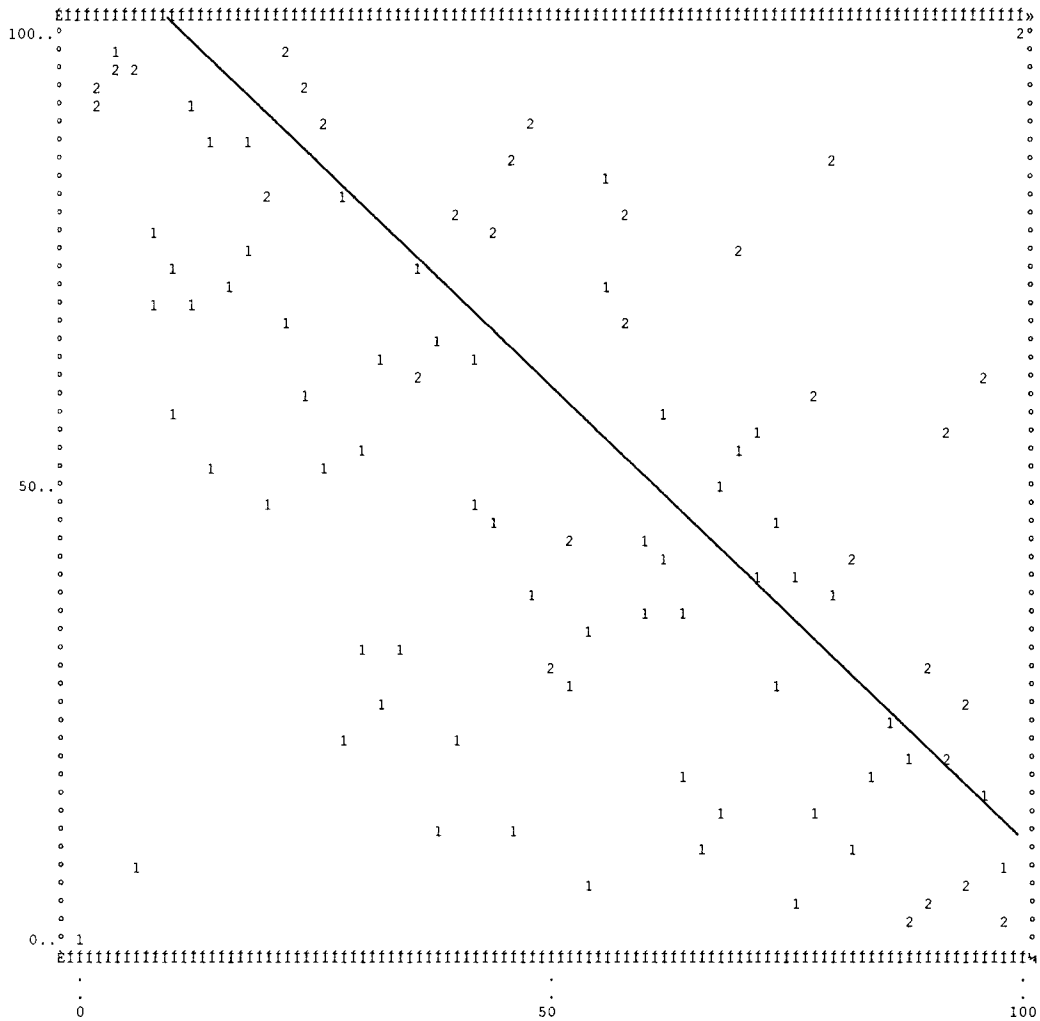
Coefficient of weak monotonicity: .73 (J-axis)

Item Plot: CON



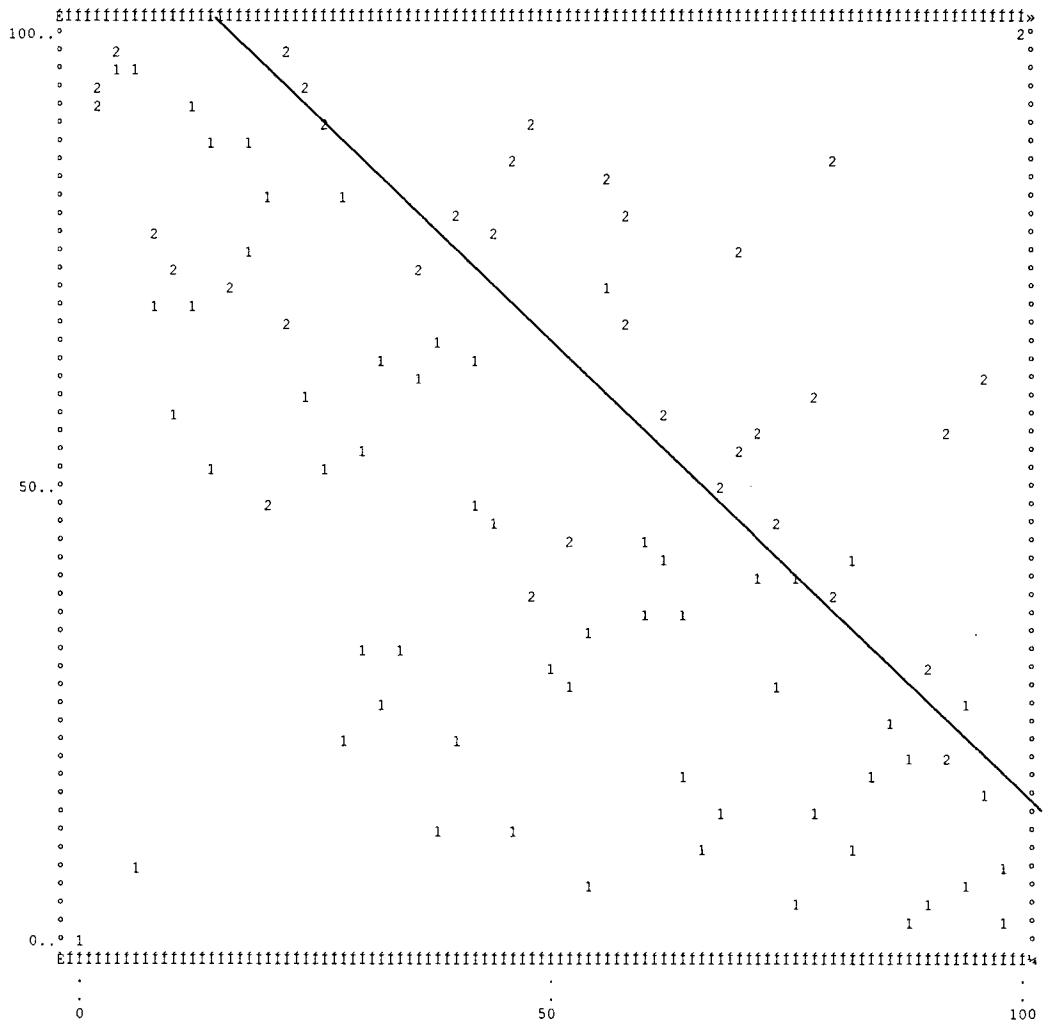
Coefficient of weak monotonicity: .78 (J-axis)

Item Plot: CRIMEKIT



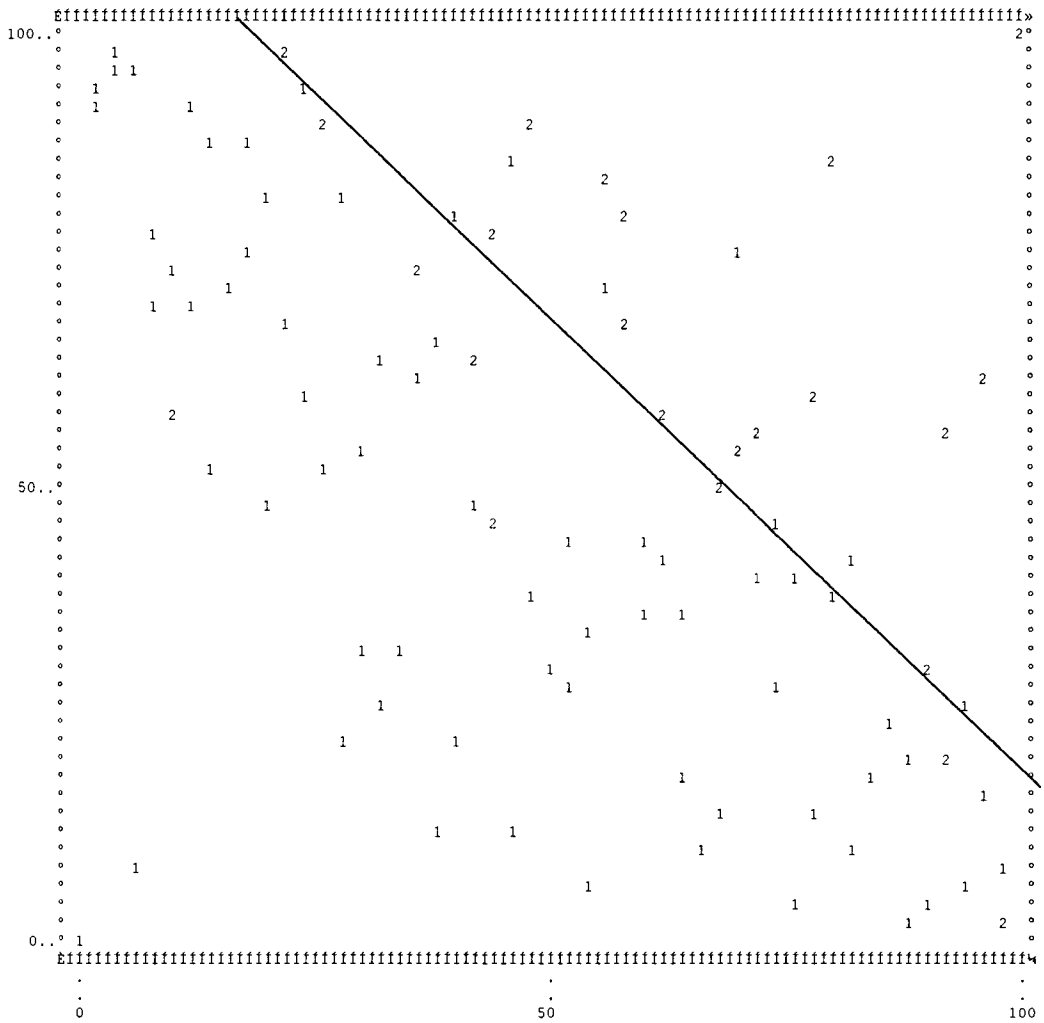
Coefficient of weak monotonicity: .83 (J-axis)

Item Plot: CAPTIVE



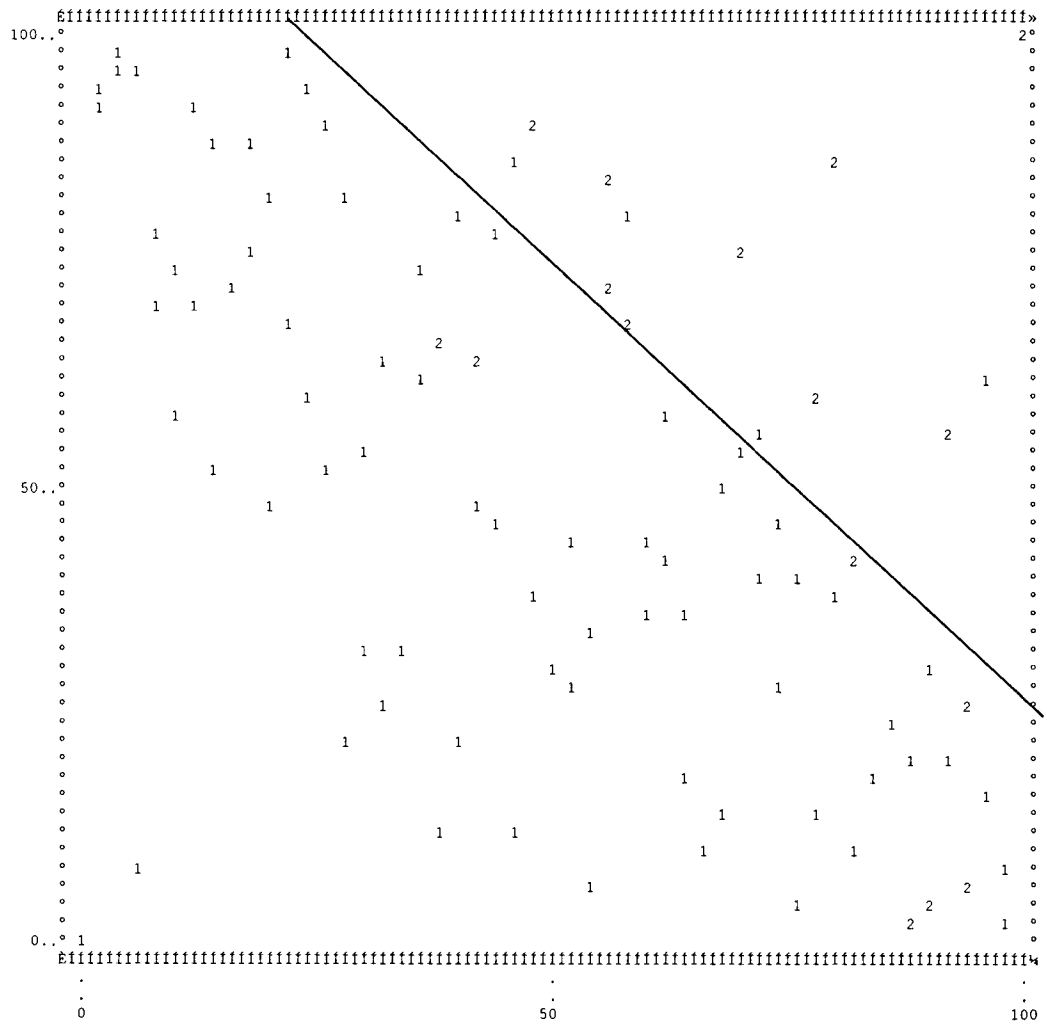
Coefficient of weak monotonicity: .85 (J-axis)

Item Plot: POSTDIS



Coefficient of weak monotonicity: .88 (J-axis)

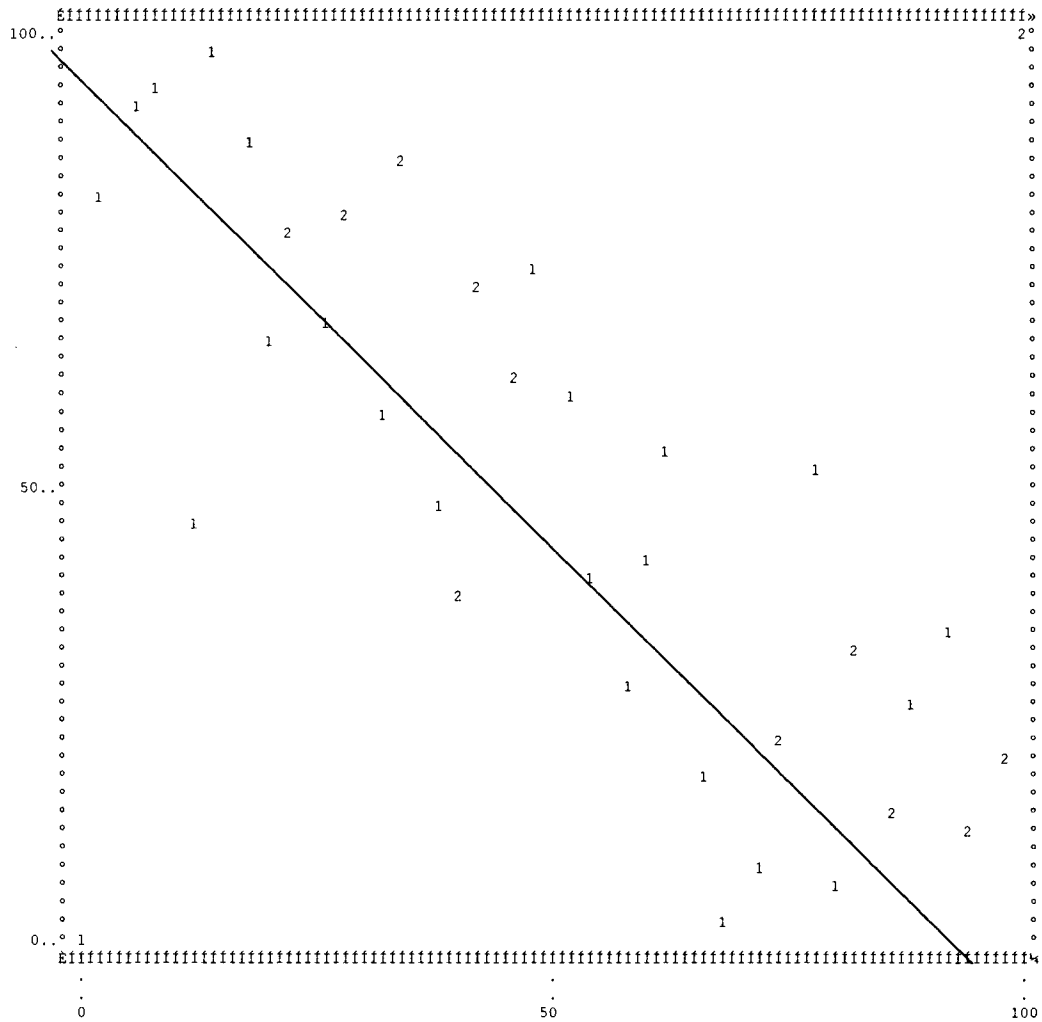
Item Plot: BODYBURY



Coefficient of weak monotonicity: .87 (J-axis)

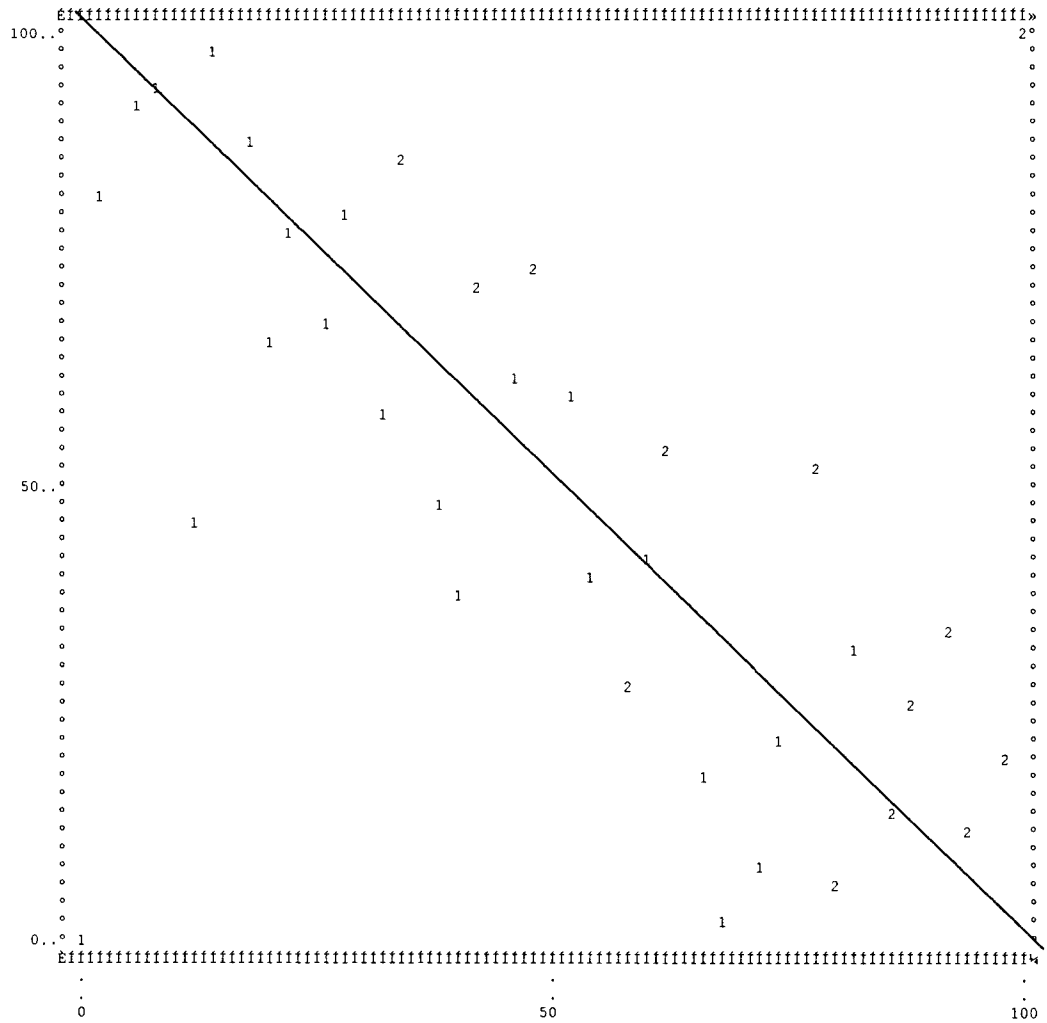
Item plots: Crime scene – involvement.

Item Plot: DIARY



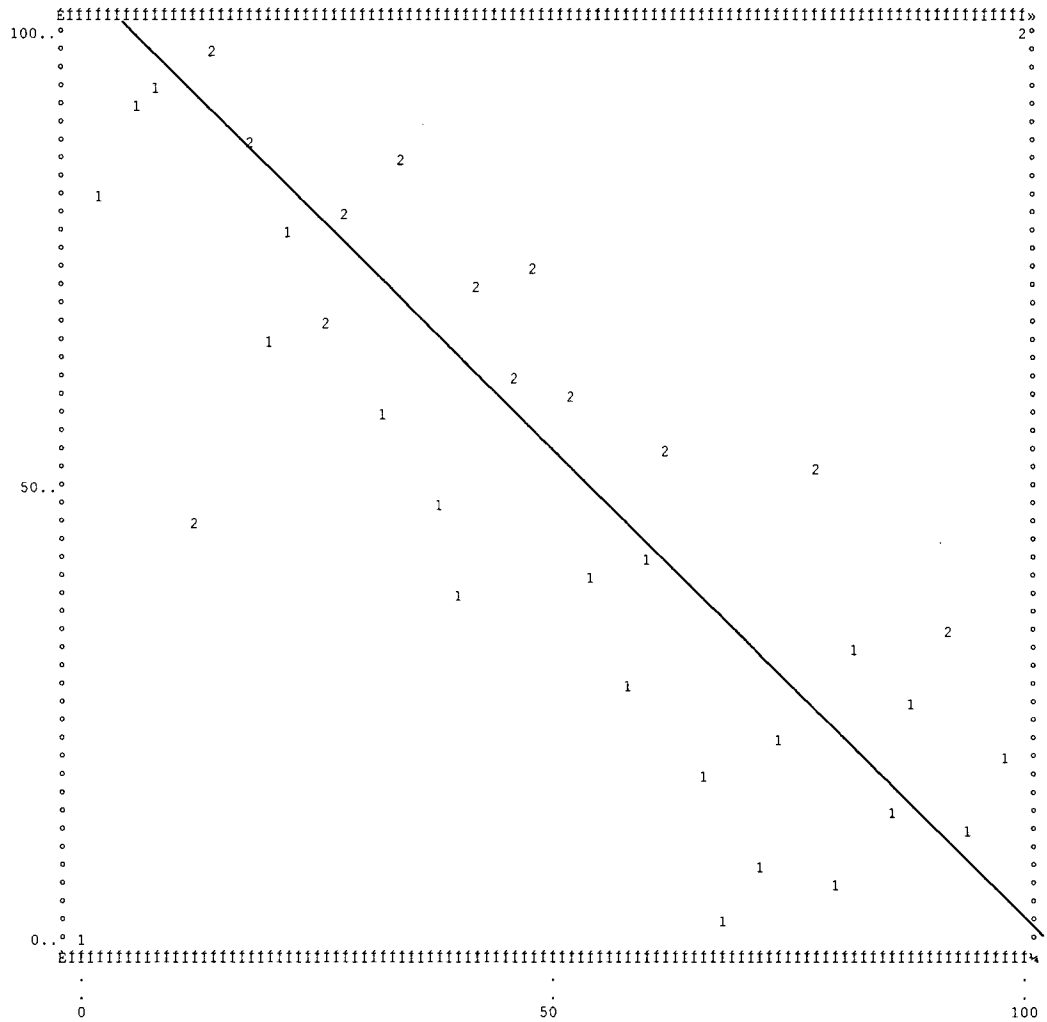
Coefficient of weak monotonicity: .70 (J-axis)

Item Plot: PHOTO



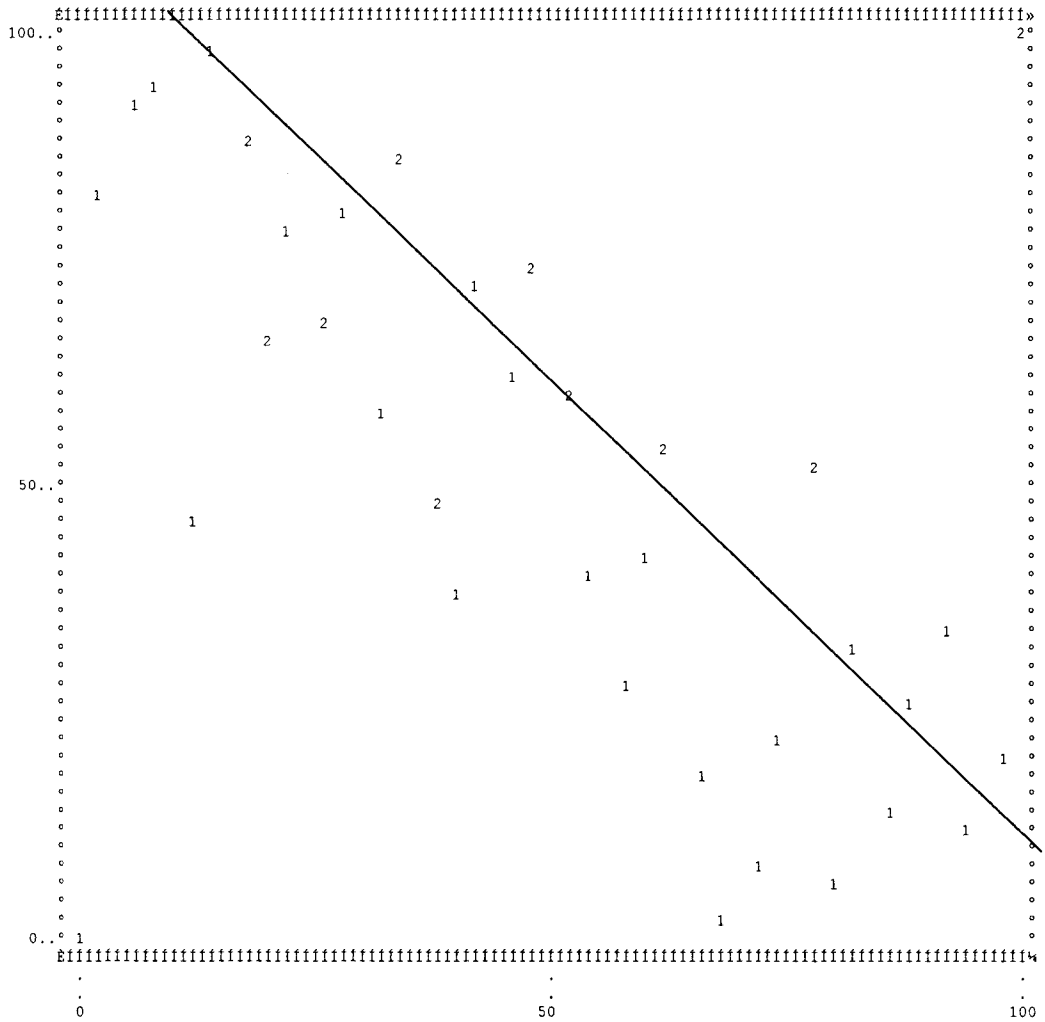
Coefficient of weak monotonicity: .88 (J-axis)

Item Plot: POSTSEX



Coefficient of weak monotonicity: .81 (J-axis)

Item Plot: CANNIBAL



Coefficient of weak monotonicity: .75 (J-axis)