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## Erratum

# Linkage analysis: *modus operandi*, ritual, and signature in serial sexual crime

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### Abstract

This article examines a process of behavioral analysis, referred to as *linkage analysis*, used in identifying sexual offenses that have been committed by the same offender. This type of analysis examines behavior that is contained in three distinct components of a crime, that is, the *modus operandi* (MO) or the “how to” of a crime, the *ritual* or fantasy-based behaviors for a particular type or series of sexual crimes, the *signature* or unique combination of behaviors, which suggests that a series of crimes has been perpetrated by the same offender. Linkage analysis involves five assessment procedures: (1) gathering detailed, varied, and multisource documentation; (2) reviewing the documentation and identifying the significant features of each crime individually across the series; (3) classifying the significant features of the crime as either MO and/or ritualistic constructs; (4) comparing the combination of MO and ritualistic features across the crimes to determine if a signature exists; and (5) compiling a written analysis that details the conclusions derived from the available information. Results of this type of analysis can be used for investigative purposes and, in some instances, can help to inform the decision making of the courts.

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## 1. Introduction

Growing awareness of the serial nature of a significant proportion of sexual crimes has motivated scientific and behavioral efforts to determine ways of linking crimes perpetrated by a single offender. Increasingly, DNA analyses allow investigators and prosecutors to scientifically determine not only the identity of the perpetrator in a single case of sexual assault, but to ascribe responsibility to the offender, in some instances, for cases that have occurred over long time intervals and geographically distinct locales. However, the availability of DNA evidence is only beginning to be consistently and readily obtainable. In a significant proportion of sexual crimes, no DNA evidence is left at the scene, or what is available for analysis is insufficient to allow for a definitive identification.

In such cases, behavioral analyses can be used to explore the likelihood that a series of crimes has been perpetrated by the same offender. We would like to describe one specific type of behavioral analysis, referred to as linkage analysis, which integrates information from three distinct, but interrelated, aspects of a crime pattern perpetrated by a single offender. These involve the modus operandi (MO) or the “how to” of a crime, the ritual or fantasy-based behaviors for a particular type or series of sexual crimes, the signature or unique combination of behaviors, which suggests with a high degree of probability that a series of crimes has been perpetrated by the same offender. Linkage analysis involves five assessment procedures: (1) gathering detailed, varied, and multisource documentation; (2) reviewing the documentation and identifying significant features of each crime individually across the series; (3) classifying the significant features of the crime as either MO and/or ritualistic constructs; (4) comparing the combination of MO and ritualistic features across the crimes to determine if a signature exists; and (5) compiling a written analysis that details the conclusions derived from the available information.

To demonstrate these principles and the process used in reaching a conclusion, the behavior of one particular offender across two assaults (see the Sanchez–Johnson case below) will be presented in some detail. Intrinsic to this kind of analyses is familiarity with various aspects of crime scene analyses and experience either evaluating or investigating a significant number of serial sexual crimes.

## 2. Modus operandi

Law enforcement has historically analyzed crimes through behaviors of the offender that are referred to as the MO or the modus operandi. Within the context of criminal investigative analyses, the term *modus operandi* is used to encapsulate all of the behaviors that are requisite to a particular offender successfully perpetrating a crime. As such, it encompasses all behaviors initiated by the offender to procure a victim and complete the criminal acts without being identified or apprehended. The MO can be quite simple or very complex, with the various degrees of sophistication reflecting the experience, motivation, and intelligence of the offender. Douglas and Munn (1992) observed that the MO is dynamic and malleable and

evolves as the offender gains both experience and confidence in his/her patterns of criminal offending.

In serial sexual crimes, the MO evolves quite rapidly over time and can present significant changes in a period of only weeks or months. This evolution manifests itself as a result of experience, the natural process of maturation, and the education, criminal or otherwise, of the offender. For example, an 18-year-old rapist who failed to use a condom and ejaculated vaginally was later convicted because of DNA evidence recovered from the victim. He served seven years and was released. Within a matter of months, he raped again, only this time, he wore a condom. The same 18-year-old rapist stole two 4-ft speakers, a collection of CDs, and a CD player from his first victim. In the offenses after his release from prison, he stole only money and jewelry from his rape victims. Another offender reported studying the professional literature on his crime of choice, as well as popular magazines that discuss in detail the crime scene behavior of infamous offenders. When he was later interviewed as a part of a federally funded research grant, he met the interviewer saying, "I know who you are. When I was raping, I did a literature search on rape and I've read everything you've ever written."

Forces outside the offender can also impinge on the manner in which the crime is implemented. The unavailability of a victim, the behavioral responses of the victim, and the interruption of an offense by another person all represent circumstances that can change aspects of the MO. One behavioral analyst was approached by a detective asking for guidance regarding a series of serial rapes. He indicated that the offender had raped 16 women and had been labeled the "First Floor Rapist." When the analyst asked about a 17th report that he found in the stack of documents, the detective asserted that the 17th offense must have been perpetrated by another offender as it had occurred on the second floor of an apartment building. The faulty assessment of the detective failed to capture the life contingencies that can impact on the criminal behavior of an offender. He had obviously not considered the possibility that the offender was unable to find a victim or to locate an unlocked window on the ground floor that particular evening and was therefore required to execute entry into a second-floor apartment to carry out his criminal intent.

However, not all features of the MO are subject to change. If a certain behavior has worked well for an offender and has not resulted in any unwanted outcomes, it is likely to be observed in future crimes of the same offender. As each behavior is executed over a number of situations, the criminal becomes more familiar with a particular series of behaviors and, therefore, more able to anticipate the outcomes of them. As with many other aspects of human behavior, this repetitive aspect of crime behavior affords the offender a sense of familiarity and control that allows him to focus more intently on the sexualized or aggressive motive for the crime.

### **3. Ritualistic behaviors in sexual crimes**

The ritualistic aspects of a sexual crime emanate from the internal psychology of a particular offender as opposed to the situational demands of committing a crime. These behaviors are derived from the motivation for the crime and the sexual fantasy that expresses

it. They are symbolic, as opposed to functional; as such, they are highly individualized and reflect the aspects of the crime scene that are unnecessary to the accomplishment of the crime but are pivotal in expressing the primary motivation or purpose of the criminal act itself. Geberth (1996) has linked this fantasy-based element of a sexual crime to the unique psychodynamics of the individual responsible for enacting these impulses through the criminal behavior.

The ritualistic aspects of a crime can also express themselves differently over a series of offenses either due to the refinement and more complete reflection of their underlying intent or fantasy substrate or through the addition of unexpectedly arousing aspects of a prior offense. This is suspected in cases of serial rape that escalates in the degree of physical force used by the offender, the increasingly intricate use of bindings, and the introduction of distinctive verbal exchanges over a series of assaults. While earlier research suggests that 75% of serial rapists do not escalate in the degree of physical violence they inflict over time, 25% do escalate, apparently finding that more severe degrees of violence or dominance enhances their arousal (Warren, Reboussin, Hazelwood, Gibbs, Trumbetta & Cummings, 1999). In other instances, bindings that begin as a way of restraining the victim can be seen to develop into a very intricate process both in terms of the materials used and the manner in which the victim is restrained. For example, one serial rapist engaged in sexual bondage with all 55 of his victims in 12 states. In his first few rapes, he bound his victims using their clothing. Over time, he began using medical tape, precut lengths of rope, which he brought to the crimes, and, eventually, handcuffs. In a different series involving sexual murders, statements demanded of the victims became an increasingly central and salient aspect of the crime, with specific and repetitive statements by the victim being scripted by the offender.

#### 4. Observations regarding MO and ritual

In assessing the MO and ritualistic aspects of a crime, certain additional themes or observations emerge from the application of this type of analysis. First, it is not uncommon for a crime scene analyst to identify more elements of the MO than of the ritual. This is not unexpected as the MO may include time, day, and location of the crime, the weapon used, sex and age of victim, the offender's mode of travel, and any number of other variables. The ritual, on the other hand, is much more narrowly focused, being composed of those acts specifically designed to compliment the motivation for the crime and to meet the psycho-sexual needs of the offender.

Second, all aspects of the ritual may not be present in every crime (Douglas & Munn, 1992). The *time* available, *mood* of the offender, and *external circumstances*, such as a roommate coming home, may all prevent the full repertoire of desired behavior from being enacted. Each of these factors can result in the ritualistic aspects of the crime being diluted, modified, or interrupted, depending on the internal state of the offender and the contingencies of a particular crime.

Third, some features of the crime may serve as part of the ritual and not be recognized as such by the analyst. For example, the manner used by an offender to approach his victim

would most often be viewed as part of the MO. However, one serial killer, who focused only on middle-class female victims for rape and murder, used guile to convince the women to accompany him. After his capture, he reported that he obtained an inordinate sense of power from his ability to convince middle-class and intelligent women to go with him, a total stranger, without having to resort to physical violence.

Fourth, some elements of the crime may function as both MO and ritual. In one particular series, a serial rapist captured numerous adult male and female couples at gunpoint in their homes and forced the wives to tie their husband's hands and feet with shoelaces. Such behavior would correctly be categorized as MO as it helped to ensure success by allowing the perpetrator to control both adults simultaneously and to use one to immobilize the other. However, having the wife neutralize the male "protector" also quite likely served as a ritualistic feature of the crime that sexually excited the perpetrator.

Fifth, there may be instances in which one or more ritualistic aspects of the crime remain known only to the offender (Douglas & Munn, 1992). One serial killer recorded his daily fantasies about capturing a particular type of woman for sexual assault. He remained very focused on victim demographics such as body style, color and length of hair, and breast size. Such features obviously played an important psychosexual role in the offender's crimes, but were only recognized as being part of his ritual after the discovery of his records.

Sixth, when an "impulsive" sexual offender (Hazelwood & Warren, 2001) is involved, the crime may be devoid of ritualistic behaviors. Such criminals act out with little or no planning. Fantasy plays a very small role in their crimes, and the involvement of paraphilic or other ritualistic behavior is seldom observed with this type of offender. However, as with all human behavior, criminal or otherwise, there will be exceptions. The reader will note such an exception in the discussion of the Sanchez–Johnson case below.

## 5. The signature in sexual crimes

Douglas and Munn (1992) described the signature as the "calling card" of an offender. In the current context, this term is used to describe a unique combination of behaviors that emerges across two or more offenses. It is a pattern that may include aspects of both the MO and the ritual. Recognition of this unique signature aspect of a crime can occur when crime analysts and/or investigators are attempting to link two or more crimes that have occurred in either close physical or temporal proximity or at times or locations that are highly divergent.

Occasionally, testimony regarding the signature of a crime series is presented in the courtroom to enhance legal arguments that the series of crimes was committed by the same offender. For example, this type of testimony was offered by one of the authors and involved the opinion that the same person was responsible for a series of six rapes (*California v. Kenneth Bogard*, 1996). In New Jersey, the Supreme Court reviewed similar testimony and allowed the expert to testify regarding similarities across a series of offenses, but did not allow the expert to offer an opinion as to whether the crimes had been committed by the same person (*State of New Jersey v. Fortini*, 2000). In a different context, testimony regarding a review of the signature aspect of two homicides was offered by the prosecution at a hearing to

determine if they would be joined for prosecution (*South Dakota v. Robert L. Anderson*, 1998). Similar with the qualification of all expert witnesses, the analyst offering this type of testimony must be qualified through education and experience, with the final decision regarding the reliability and probative value of the testimony being determined by the judge and eventually by the jury.

## 6. A case example

At 12:50 a.m. On November 12, 1997, Margarete Sanchez (pseudonym), a 29-year-old Hispanic woman, was found dead inside one of four large concrete sewer pipes that were lying on the ground between a footpath and a well-traveled six-lane highway. Ms. Sanchez left her boyfriend, Fernando Gonzalez (pseudonym) and her four children in a motel room at about 11 p.m. to walk to a convenience store a few blocks away. When she did not return, Mr. Gonzalez sent some teenagers to look for her. They returned without having found her and he set out along the path. As he approached the four concrete pipes, he noticed foodstuffs lying on the path, and when he bent down to examine the materials, he saw Ms. Sanchez's body in one of the pipes and cried out. Tory Smith (pseudonym), who had been working on his car under a nearby streetlight, came over and, together, they removed her body from the pipe. She wore a striped T-shirt, but was braless and nude from the waist down. Smith draped his T-shirt over the lower portion of Ms. Sanchez's body.

A woman who lived directly across the street from the crime scene told the police that she and a male friend were returning to her residence at about 11:30 p.m. when she saw a light-skinned male leave the area of the concrete pipes. Another witness, who was driving on the six-lane highway, reported that at about 11:30 p.m., he observed two people by the pipes and they appeared to be waving their arms. He told the police that one of them was taller and the shorter person had bushy hair (as did Ms. Sanchez). The police found a convenience store receipt at the scene that was dated and time-stamped at 11:29 p.m. A cheese steak sandwich was among the items on the receipt but was not found at the scene. Also missing were the victim's shorts, panties, and an inexpensive necklace.

About 150 ft from the body, the police found Ms. Sanchez's shorts and panties hanging from a bush. The panties were inside the shorts and the right rear pocket was pulled out. A short distance from the shorts, a partially eaten cheese steak sandwich was found on a stone wall. The necklace was never found.

Ms. Sanchez had been brutally beaten in the upper part of her face, resulting in severe bruising. Fists were believed to be responsible for the blunt force trauma. Her nose was broken, her hyoid bone was fractured, and death was attributed to manual strangulation from the front. Although there was no evidence of recent ejaculation, there were spermatozoa present in the vagina. Mr. Gonzalez advised that he last had vaginal sex with Ms. Sanchez the night before her death and had last had anal sex with the victim 1–2 weeks before her death. It was the medical examiner's opinion that the presence of the spermatozoa were not associated with her murder.

Ms. Sanchez's anus had been torn; however, there was no "reaction" the tearing, indicating that the tears were fresh and that she had died before the healing process could begin. These injuries were attributed to a violent penetration either with fingers or penis. Ms. Sanchez had been bitten at least twice on her chin and again on the outer aspect of her left breast.

The crime remained unsolved until the following April when, on one evening at about 8:45 p.m., Samantha Johnson (pseudonym), a Caucasian 36-year-old off-duty police officer, was driving her marked cruiser to her home. She was traveling southbound on an interstate highway when she saw a small car parked in a northerly direction in the southbound breakdown lane. She parked in front of the smaller car and both Ms. Johnson and the male driver got out of their cars, meeting between them. She identified herself as a police officer and the man acknowledged her status and gave her his driver's permit. Smelling alcohol, Officer Johnson administered a Breathalyzer test, and the man tested positive for intoxication. She put him in her car and called for another officer to take the man to jail. The officer informed her he could not assist for at least 40 minutes. The intoxicated driver had been cooperative and so she told the second officer that she would wait for him.

Within 30 minutes, the man began trying to convince Officer Johnson to let him go and "everything would be okay." She later testified that he had remained calm during their conversation, but that suddenly "...he went bonkers." She recalled him hitting her with his fists before she lost consciousness. She awakened to find him attempting to manually strangle her from the front and she pried one of his fingers back and then again lost consciousness. She again awoke to find herself nude from the waist down and in the passenger seat with the man driving at a high rate of speed. Her kidnapper had driven away with her when the second officer arrived to take custody of the man. She opened her door and hung on as the man shouted for her to "...jump bitch." She said that he pushed her as she jumped from the car while it was traveling between 65 and 75 mph. Amazingly, she survived.

Officer Johnson had been beaten in the upper part of her face, resulting in severe bruising around her eyes. She had a broken nose and she had been bitten on the chin as well as the outer aspect of her left breast. Her lower garments had been removed and, although her shirt was in place, her bra had been ripped off her body. Officer Johnson also suffered severe vaginal and anal injuries.

## 7. The linkage analysis

As summarized earlier, linkage analysis involves five distinct but interrelated activities:

- (1) *Gathering the necessary documents.* In a series of rape cases, this phase of the assessment focuses on the victim's statement, police and medical reports, and, if available, a commercial map depicting all significant locations (i.e., confrontation, assault, release) associated with each of the crimes and the distances between those locations. In homicide cases, such documentation would include police, autopsy, and toxicology reports, crime scene and autopsy photographs, and, if all crimes occurred within a particular city, a

commercial map depicting the abduction and murder sites, if known, the body disposal sites, and the distances between each of the various locations.

- (2) *Reviewing documentation and identify significant crime features.* This phase of the assessment allows the analyst to not only capture the significant aspects of each crime, but to become intimately familiar with all offenses in the series and to be able to access pertinent crime behaviors without having to search through volumes of data.
- (3) *Analyzing the crimes and identifying the MO and/or ritualistic behaviors.* At this stage, the analyst conducts a detailed study of the significant crime features and identifies those factors that form the MO and those that comprise the ritual.
- (4) *Determining if a signature exists across the crimes.* The analyst attempts to identify whether a unique combination of behaviors exists across the series of crimes.
- (5) *Preparing the opinion.* The written opinion should, at a minimum, include a listing of the materials reviewed, whether site visitations occurred, a listing of those crime features that comprise the MO and those that form the ritual, and, if present, set forth the unique combination of behaviors that identify the signature.

The analyst should also be prepared to discuss any dissimilarities noted across the series of crimes and why they do not negatively impact the opinion.

The person who attempted to murder Officer Johnson was arrested and convicted of numerous felony offenses. He was extradited to the state in which Margarete Sanchez was murdered and stood trial for that homicide. While the analyst was not allowed to testify that the same person was responsible for both crimes, he was allowed to testify about the MO, the ritual, and the similarities he had identified across both crimes.

## **8. The analysis in the Sanchez–Johnson cases**

The prosecutor requested that the analyst provide two opinions: (1) the primary motive for the attacks and (2) whether a signature existed across the crimes.

### *8.1. The motive*

Anger was determined to be the primary motive underlying both crimes. The anger was directed toward women in general and was preexistent to the crimes. This anger had been acted out in a sexually violent manner and the taking of the necklace from Ms. Sanchez was of secondary importance to her killer. Supporting this opinion were the following behaviors: (1) both victims were brutally beaten, and the amount of force was much greater than that needed to subdue them for either robbery or sexual assault; (2) both women were manually strangled, and this is a much more personal method of killing than strangulation with a ligature; (3) both women had injurious and penetration, a form of sexual assault closely associated with anger-motivated sexual crimes. Following his testimony, the analyst learned that the killer told an informant that he grasped the victims by the vagina and anus to drag them from one location to another.



### 8.2. *The MO*

The analyst testified that the following features formed the MO in the murder of Ms. Sanchez and the attempted murder of Officer Johnson.

Margarete Sanchez (1997)	Samantha Johnson (1998)
High-risk crime	High-risk crime
Impulsively committed crime	Impulsively committed crime
Female	Female
Similar age	Similar age
Victim of opportunity	Victim of opportunity
Alone at time of crime	Alone at time of crime
Heavily traveled road	Heavily traveled road
Occurred during darkness	Occurred during darkness
Blunt force	Blunt force
No external weapon used	No external weapon used
Trauma to upper face	Trauma to upper face
Nude from waist down	Nude from waist down
Shorts and panties intertwined	Pants and panties intertwined
Shirt left on, breasts free	Shirt on, breasts free
No (fresh) seminal fluids on/in victim	No seminal fluids on/in victim

### 8.3. *The ritual*

The analyst testified that the following features formed the ritual in both cases. It is noted that these features compliment the primary motivation of anger and also serve to sexually excite the offender.

Margarete Sanchez	Samantha Johnson
Brutal facial beating	Brutal facial beating
Manual strangulation from the front	Manual strangulation from the front
Injurious anal penetration	Injurious anal penetration
Bite to chin	Bite to chin
Bite to outer aspect of left breast	Bite to outer aspect of left breast

### 8.4. *The signature*

A signature was identified across the two crimes. In this case, the signature involved features of both the MO and ritual. While each element of the killer's MO had been individually observed in other crimes by the analyst, this group of features combined with the ritualistic behaviors identified in the two crimes formed a unique combination and, therefore, a signature for this particular series. In other words, the co-occurrence of the functional

aspects of the MO and the more symbolic or ritualistic aspects of the crimes created the signature of this offender in this series of crimes.

### 8.5. Dissimilar features of the crime

As previously mentioned, it is important that the analyst be prepared to discuss any dissimilarities in the series and why they do not negatively impact on the signature opinion. The following features of the two crimes were found to be dissimilar.

Margarete Sanchez	Samantha Johnson
Hispanic	White
Murdered	Attempted murder
Sandwich/shorts/necklace taken	Vehicle taken
Found in concrete pipe	Found on highway
Fractured hyoid bone	N/A
Victim walked to crime scene	Victim drove to crime scene
Occurred at 11:30 p.m.	Occurred at 8:45 p.m.
Occurred on Monday	Occurred on Thursday–Friday
Victim was 5 ft 4 in. tall	Victim was 5 ft 9 in. tall
120 lb	140 lb
Occurred in New Jersey	Occurred in a different state

Of the 11 features noted, 8 of them (race, height, weight, time, day, state, mode of travel, and disposal site) can be attributed to the crimes having been impulsively committed against victims of opportunity. As for the three remaining features (fractured hyoid bone, murder, and theft of a personal item), they certainly pose no threat to the signature opinion. Ms. Sanchez was manually strangled and her hyoid bone was consequently fractured. Officer Johnson was also manually strangled and would have died (with a crushed hyoid bone) had the second officer not arrived when he did and had Officer Johnson not succeeded in escaping. It is also probable that this interruption deterred a theft from the personal effects of Ms. Johnson.

### 8.6. Features other than MO or ritual

Almost invariably, there will be features of a sexual crime that cannot be accurately described as either MO or ritual and/or that may not be fully understood by the analyst. In this case, the taking of Ms. Sanchez's shorts with panties intertwined, the taking of the cheese steak sandwich, and the partial eating of the sandwich cannot be properly labeled as either MO or ritual. Because the pocket of the shorts was turned inside out, it is reasonable to assume that the killer took Ms. Sanchez's shorts as he searched for money or possibly drugs. In that the cheese steak sandwich had been partially eaten, it is reasonable to assume that the killer was hungry even after the murder.

As with practically every sexual crime, there are also elements that may never be satisfactorily explained. For example, the location of Ms. Sanchez body in the concrete pipe

is puzzling. It may be concluded that the killer placed her into the pipe, so that he could carry out his crime without being observed or to delay her discovery, and, if that is so, the act becomes part of his MO. However, it may also be concluded that she crawled into the pipe in an unsuccessful attempt to get away from her killer. If that is so, then it is not related to the offender's behavior at all.

## 9. Conclusions

The serial nature of a significant proportion of sexual crimes has motivated efforts to determine ways of linking crimes committed by a single offender. In such cases, behavioral analysis can be used to explore the likelihood that a series of crimes was committed by the same person. An assessment of the MO and the ritual features of sexual crimes may result in the identification of a unique combination of behaviors or signature. The signature is viewed as a highly individualized and unique combination of habitual aspects of offending behavior derived from the fantasy and motive for a series of crimes perpetrated by a single offender. It is assumed that the combination of behaviors observed in the signature of a crime series is so distinct as to inform not only the investigation of multiple sexual crimes but also aspects of court decision making regarding specific offenders.

Within the investigative context, this type of analysis could not only assist the investigative team in organizing their information and networking with other police jurisdictions, but could also help with crime prevention efforts by identifying the possible time and location of future crimes potentially perpetrated by the same offender. When offered in the legal arena, it can provide a framework for helping to inform judges and juries as to the various behavioral components of serial sexual crimes and the uniqueness of a particular combination observed across a series of offenses. As a form of crime scene behavioral assessment, linkage analysis offers the experienced investigator or evaluator a framework for distilling a large amount of crime scene information into a succinct comparative framework that can inform efforts to potentially link offenses within the legal arena.

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