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been last seen. The victim's last seen site can be developed from any number of sources: 1) eyewitness accounts; 2) visual sightings; 3) telephone conversations; 4) official documents, such as traffic citations, police field reports, jail booking logs, long distance calls, toll records, and credit card receipts. As Egger (1997) pointed out it is imperative for investigating officers to follow up on where the predator met his prey.

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networks are important features in the selection of victims (Douglas et al., 1986). The serial killer Bobby Joe Long provides a classic example of an offender who targeted prostitutes in red light districts in Tampa, Florida USA (Schechter & Everitt, 1996).

Another feature that sets the five victim social networks apart from less valuable areas is, locations where individuals have little or no bond to the neighborhood. These include transient people who lack a strong network of friends, acquaintances, and family ties. Egger (1997, p.74) refers to these victims as "the less-dead" victims. These are society's throwaways due to the irritant symbols they represent. Because of society's lack of regard for these victims it is not unusual for a person not to be seen for days or weeks in these types of areas. Therefore, police are likely to regard their disappearance as trivial. Police investigators should make contact with the victim's family members including any significant others who may have information regarding any recent change in lifestyles or personality. This information can provide police with the victim availability and their susceptibility (Holmes & Holmes, 1996).

SUMMARY AND CONCLUSIONS

With every act that leaves behind evidence associated with each crime in the series, the killer provides information that can indicate with increasing accuracy the location of his home base. It is posited that the location of the initial offender-victim contact may be of more direct assistance in helping to delimit the area in which the offender resides than the sites at which victims' bodies are discovered. Clearly, though, the body dump sites are more likely to be objectively established by the police than the initial victim target areas. However, by using the decision-making process in Figure 1 police investigators can initiate proactive policing strategies in victim targeting areas in order to detect possible suspects and future victims who may be targets of a serial killer. Or, if the suspect displaces, this would usually indicate to investigators their proactive policing in the victim target network areas is having an affect.

The application of VTN strategies can have direct implications for systems such as criminal geographical targeting (Rossmo, 1995), leading to the hypothesis that this procedure might be more efficient if it commenced with abduction sites followed by body dump locations (Godwin & Canter, 1997). However, investigators should view body dump sites with caution for predicting the home area of a serial killer. The systematic changing of locations and distances relative to the home base may be a deliberate ploy to distract police attention from the killer's home base.

This study certainly supports the view that investigative efforts should go into interviewing people within the neighborhood from which victims go missing in order to pinpoint precisely the address or location where the victim may have

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tion. In the event, however, the killer has cues to contradict that the abduction will not be witnessed and that he will not be seen by police, he then scans the area for principal escape routes. If there are easy escape routes, then the killer will most likely target and abduct his victim. If there are no easy escape routes he will likely abort his plan of attack or displace to another area.

The decision-making process demonstrated in Figure 1 shows that police presence in potential victim target network areas can affect the killer's decision to attack or not. However, as is often the case in a serial murder investigation, determining how to link victims is often difficult. One way to accomplish this is for police to know the high risk areas, and the environmental networks that tie potential victims together. This is done by looking at victim social networks.

TABLE 1
VICTIM SOCIAL NETWORKS
AREAS OF HIGHEST RISK FOR VICTIMIZATION FROM SERIAL KILLERS

▶	Urban Subcultures (heterosexual and homosexual bars, night clubs, and red light areas)
▶	Isolated Landscapes (parking lots, jogging paths, and rest areas)
▶	Areas with high concentration of elderly and poor individuals
▶	Skid Row (derelict areas of a city)
▶	University Campuses

VICTIM SOCIAL NETWORKS

Victim social networks provide the serial killer with opportunities to prey on transient persons, for example, lost or run away children, mental patients, and prostitutes. Victim social networks are also important for determining where the killer resides and works. Table 1 lists the geographical areas in the USA where the highest risks for victimization from serial killers exist. These landscape layouts provide the serial killer with ease of access and escape routes to avoid detection. For example, from the five high risk victim targeting areas the university campus appears to be a safe place. However, university campuses, at least in the USA, have certain landscape features which make them ideal for hunting and abducting victims. Isolated parking lots provide ample opportunities for serial killers to abduct victims. Increasing lighting on university campuses has improved safety, however, the serial killer is still willing to take their chances in open areas. For example, Theodore Bundy, a contemporary serial killer, provides a classic example of an offender who targeted many of his victims on college campuses (Keppel & Birnes, 1995).

Victim social networks also relate to the incidence and location of streetwalking. Different landscape features are used by prostitutes to manipulate the environment for their own purposes, and potential victims of crime often seek out these types of locations for their solicitations (Ricci, 1992). For example, Symanski (1981) pointed out that streetwalkers tend to stand near bus and taxi stops, and research on victims of serial killers has confirmed that these two social

study also found that serial killers progressively travelled closer to their homes as they targeted more victims.

VICTIM TARGETING NETWORKS (VTN)

The victimological approach to serial murder begins with the assumption that serial killers carry geographical templates in their mind. They have a certain kind of place in mind where experience has taught them where suitable victims can be found. Each subsequent trip to these crime locations forms something of an analogy with previous successes, modified by experience and perhaps intelligence gained from previous murders. The killer's perception will be shaped by both actual characteristics and those inferred from factors such as where a victim hangs out and with whom.

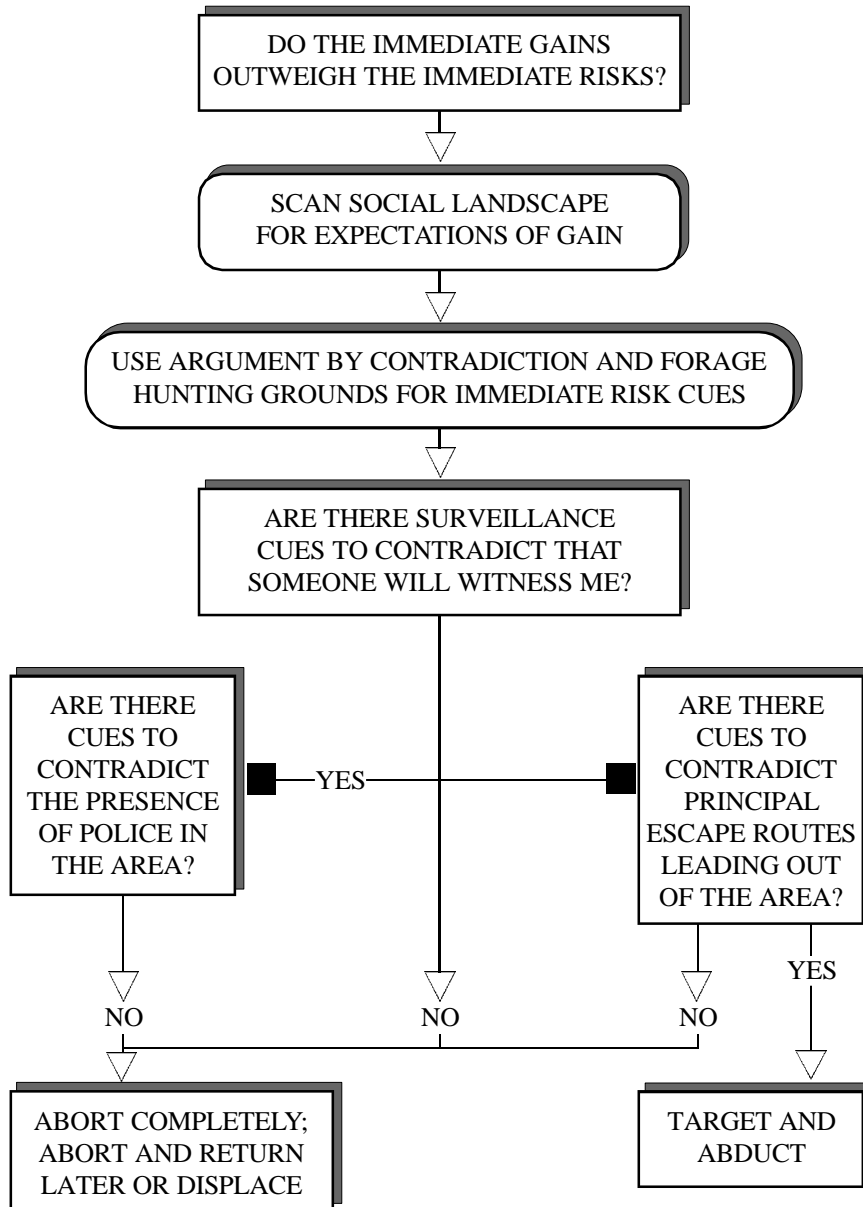
Routine activities enable the killer to make contact with targeted victims and to shape expectation for interaction. The situational context within which network interactions occur is critical to understanding the hunting patterns of a predator. For example, if the killer targets victims in a location at which contact is likely to be witnessed, the chance of detection will increase. An analysis of the ecology of possible victim-offender contact settings can help to narrow the focus of an investigation to promising areas for locating witnesses, including surviving victims, and the general home base area where the killer lives.

DECISION-MAKING PROCESS IN TARGET NETWORK AREAS

Figure 1 shows the decision-making process that a serial killer may use while hunting for a suitable target area and victim. His immediate question is, are there available victims to grab where the risk is low for being noticed? After the offender has made this decision, he scans the potential target area for easy and accessible victims. Similar decision-making processes have been found in burglars. For example, Rengert and Wasilchick (1985) analysed decision-making processes of suburban burglars, and they found that most burglars spent hours driving around different communities during the day pre-determining ideal targets and times for their criminal activities.

Once the offender has made his decision to target a specific location, he then uses the argument by contradiction decision-making process to determine the level of risk involved in the attack. For example, he may ask, are there surveillance cues to contradict that someone will witness me make the abduction? This is a major concern for the serial killer. For example, James (1991) in a study on 28 US serial killers found that 61% of the cases were solved due to eye witnesses compared to a direct result of police investigative work. The killer may also look for the presence of police in the area. If the killer has no cues to contradict that the abduction may be witnessed and that he will be noticed by the police, then he is likely to abort the crime completely and return later, or displace to another loca-

Figure 1:
The Serial Killer's Decision-Making Process in Victim Target Networks



more than one location involved in their activities. However, besides the location of the site where the victim's body is dumped there is usually at least one other important site, the point at which the victim is first encountered or targeted. For example, Rossmo's geographical profiling model takes into account mainly victims' body disposal sites when predicting the home base of a serial killer. Other researchers also argue that victims' body dump locations are more reliable than those sites in which victims are targeted (Canter & Hodge, 1997). They point out that abduction sites are usually not known to a police investigation, therefore, body dump sites provide investigators an immediate and more accurate description of the killer's foraging grounds. The theory put forth in the Canter and Hodge study seems to originate from animal foraging theories, and the popular belief and research (Repetto, 1974) that criminals have routine activities and a limited awareness space. It is reasonable to assume that criminals learn about space through their daily routine activities, however, there is the question whether serial killers are active agents in the environment rather than a simple reactor to physical and social elements within this environment. For example, Rengert and Wasilchick (1985) demonstrated that crime trips of suburban burglars are more likely to be skewed in the direction of nodal centres such as workplaces and city center districts. In a later study Rengert (1987) concurred with his earlier findings that locations of crime sites are most likely to be skewed. In a similar vein, on-going research by this author suggests a directional bias in serial killers' trips to target and dispose of their victims rather than a circular pattern as proposed in the literature (Canter & Larkin, 1993). This directional bias could be due to the offender's routine activities and general knowledge of the area. However, there is also the possibility it results from pre-planning as is the case in many serial murders. For example, Rengert and Bost (1987) demonstrated that robbers living in housing projects exhibited behavior designed to avoid recognition by traveling further from home to commit their crimes.

Through daily travel the home environment becomes a unique place of familiar, known, and predictable activities, people, and physical elements, a focal point of one's experiential space (Feldman, 1988). Thus, through habitual, focused, and satisfying involvement in a residential locale, the tangible home area becomes an enduring symbol of self, of the continuity of one's experiences, and of that which is significant and valued by the inhabitant. The landscape around the home may thus be hypothesized to provide serial killers with those enduring symbolic experiences and a relatively conformable environment to hunt for their prey. Conversely, since the victim's body carries the most evidential clues it could be expected that serial killers will distance their crimes from their domiciles. For example, in a recent study on 54 US serial killers (Godwin & Canter, 1997) found that the mean distance from the offenders' home bases to the victims' abduction sites was 1.46 miles and 5.0 miles for the body dump locations. The

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but these have not been related to empirical studies testing hypotheses about the distances serial killers travel to carry out various crime related activities. Consequently, an understanding of the processes that shape serial killers' spatial behavior has not been developed.

There is one notable exception, the work of Rossmo (1993,1995,1996). Calling his approach criminal geographical targeting (CGT), Rossmo has combined concepts from environmental criminology with a mathematical model, based on a distance decay function, derived from the locations in which killers leave their victims' bodies, to indicate the area in which a serial killer may be living. The reasons for the proposed decay are not exactly clear but are usually presented in relation to the least-effort principle. This postulates that when multiple destinations of equal desirability are available, all else being equal, the closest one will be chosen (Zipf, 1950). Another principle that is incorporated into Rossmo's geographical profiling technique, that has been put forward as a basis for determining crime locations, is that there will be a tendency for offenders to avoid committing crimes close to where they live, often referred to as a 'buffer zone' (Brantingham & Brantingham, 1981, 1984). The proposed reason for this is to avoid leaving incriminating evidence near to where they live. However, the evidence for this is sparse. Davies and Dale (1995) for example find no evidence for it in their limited study of single rapists. Although Rossmo has not published any studies demonstrating the nature of the validity of his distance decay algorithms nor how they compare with other approaches he has provided illustrations of the utility of his technique.

A variety of distance related processes have been propounded in the literature on the importance of crime locations in serial murder. These geographical processes are mainly derived with an environmental criminology bias (notably Brantingham & Brantingham, 1981) that could be seen to be logically in conflict. One is a tendency to minimize effort close to home, which would predict that crimes are in a closely circumscribed area. A second is the tendency to keep a minimum distance away from home. These two processes combined would lead to the prediction of an optimum distance from home to all of a particular type of offense. However, the general finding is one of an aggregate decay of the frequency of crimes as their distances increase from home. These processes are derived from two considerations. The first are instrumental crimes often with a tangible material benefit, such as theft or robbery. Crimes of this nature usually require some degree of planning. The second are crimes of opportunity that rarely involves pre-planning. So although these processes have relevance to violent crimes, such as serial murder, there are questions about how important emotional issues are ignored by such rational models?

Two further complexities raise questions about the relevance of these rational processes to geographical profile serial killers. The first is that there is typically

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The situational context in which the serial killer targets his victims is critical to understanding the hunting patterns of a predator. However, police and researchers eschew victim target networks (VTN). Rather, their attention is overwhelmingly concerned with the offender's characteristics. As an alternative to traditional police investigations, this paper suggests that by directing attention to victim target networks, inferences about the decision-making process underlying the selection of crime locations, victims, and locating offenders' home bases can be made. The paper presents a decision-making model that the serial predator uses to scope out potential victim target networks and shows how proactive policing in victim target areas can deter the killer. The study also posits that by directing investigative attention to victim social networks, police can first identify a set of prospective victims targeted by a serial killer. The study closes with suggestions about the applicability of law enforcement use of victims' targeting networks and how victim social networks can be used to link serial murder victims.

It has been established that there is a relationship between solving homicides and having information about a number of important locations. A recent study on the factors that contributed to solving serial murder investigations found that time and distance proved significant, suggesting that the more information on "the location of the original contact between the victim and the killer, where the assault occurred, the murder site, and the body recovery site the more likely a murder case will be solved" (Keppel & Weis, 1994, p.386). Yet despite the importance of their locations, and the great cost of extended police investigations, the detailed consideration of offense locations and why they may be important are rarely researched. A few anecdotal illustrations are recorded by retired Agents from the FBI Behavioral Science Unit in their memoirs (Ressler & Shachtman, 1992; Douglas & Olshaker, 1996). They acknowledge that determining where victims are targeted and dumped is an important factor in solving serial murders,

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