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Self-Defensive Gun Use by Crime Victims

A Conjunctive Analysis of Its Situational Contexts

Timothy C. Hart
Terance D. Miethe
University of Nevada–Las Vegas

As a means for analyzing categorical data, conjunctive analysis is an emerging analytic approach used in both exploratory and confirmatory research. This technique is applied in the current study to examine two important issues related to the use of firearms as a means of self-defense by crime victims. Using data from the National Crime Victimization Survey, the current study uses conjunctive analysis (a) to examine the contextual factors associated with the use of a firearm by crime victims as a means of self-defense and (b) to identify the situational factors most closely associated with instances where the self-defensive use of a firearm is most and least effective. Results are discussed in terms of their implications for future research.

Keywords: *firearms; self-protective measures; National Crime Victimization Survey*

Crime victims respond to criminal events in different ways. Some crime victims take a passive approach whereas others take a more active role. Among active responses to criminal situations, victims may call out or attempt to attract the attention of others, run or drive away, try to persuade or appease an attacker, or employ physical force in an attempt to stop an offender. One of the most forceful victim responses to a crime is to threaten to attack or to attack an offender with a firearm.

There is a growing body of scientific literature investigating the extent to which victims respond to crime by using a gun as a means of self-defense (Azrael & Hemenway, 2000; Cook & Ludwig, 1998; Hemenway, 1997; Kleck, 1988; Kleck & Gertz, 1995, 1997; Mauser, 1996; McDowall & Wiersema, 1994; Rand, 1994). Although there is a lack of consistency with respect to how often this occurs, past research suggests that it is usually effective in decreasing the likelihood that a victim will experience injurious harm. Researchers have also consistently identified specific contextual factors that influence the outcomes of crimes where victims effectively

Authors' Note: Please address correspondence concerning this article to Timothy C. Hart, University of Nevada, Las Vegas, Department of Criminal Justice, 4505 Maryland Parkway, Las Vegas, NV 89154-5009; phone: 702-895-0233; fax: 702-895-0252; e-mail: timothy.hart@unlv.edu.

use a firearm as a means of self-defense. However, past research examining this issue has almost always employed "main-effects" multivariate regression models as an analytic strategy. Although this is a popular approach, it likely masks some of the important nuances associated with this phenomenon. Most importantly, because it ignores the possible context-specific effects of these actions, estimates produced from predictive models may produce estimates that are not valid.

The current study applies the method of conjunctive analysis (see Hart & Miethe, in press; Miethe, Hart, & Regoeczi, 2008) to explore the situational contexts associated with self-defensive gun use by victims of nonfatal violence. This approach is also used to identify both the normative and deviant contexts for self-defensive gun use and the outcome of these situations. After identifying the particular situational factors and contexts in which defensive firearm use is most and least effective, our results are then discussed in terms of their implications for future research and public policy on self-defense and victimization.

Self-Defensive Gun Use and Outcomes

It is unclear how often crime victims use guns self-defensively. Estimates from the National Crime Victimization Survey (NCVS) suggest that crime victims use a gun self-defensively in approximately 65,000 violent incidents each year (McDowall & Wiersema, 1994; Rand, 1994). Estimates produced by the NCVS are considerably lower than those produced by other surveys. For example, data from the National Self-Defense Survey (NSDS) suggest that guns are used defensively by crime victims approximately 2.5 million times each year (Kleck & Gertz, 1995). The differences between estimates produced by the NCVS and the NSDS are likely because of the different methodological approaches used by each survey. Although there is considerable debate over which survey estimates are more valid (see Cook & Ludwig, 1998; Cook, Ludwig, & Hemenway, 1997; Hemenway, 1997; Kleck & Gertz, 1995, 1997; Mauser, 1996), there is less disagreement over the effectiveness of self-defensive gun use by crime victims.

In general, the chances of property loss as well as personal injury are decreased when victims respond to victimization either forcefully or nonforcefully (Tark & Kleck, 2004). These findings hold true regardless of whether the incident involves violent crime in general (Kleck & McElrath, 1991; Tark & Kleck, 2004) or specific types of violent victimization such as rape or sexual assault (Fisher, Daigle, Cullen, & Santana, 2007; Scott & Beaman, 2004; Siegel, Sorenson, Golding, Burnam, & Stein, 1989; Tark & Kleck, 2004) or robbery (Kleck & DeLone, 1993; Tark & Kleck, 2004; Ziegenhagen & Brosnan, 1985). When studies focus on armed resistance with a firearm by crime victims in particular, findings suggest that it has the strongest effects on reducing the risk of injurious harm to the victim (Kleck & DeLone, 1993; Kleck & McElrath, 1991; Tark & Kleck, 2004).

Most studies in this area rely on main-effect prediction models to identify (a) significant factors related to effective self-defensive gun use and (b) the relative influence each significant factor has on the probability a firearm will be used effectively. However, these models likely produce biased estimates of the effects of the included variables because this main-effect specification assumes that the effect of any particular contextual factor is constant across levels of the other variables. Although the effectiveness of self-defensive gun use may be more effective in some situations than others (e.g., when the victim is alone, the offender is a stranger, the offense occurs at night), the estimation of this main-effects model ignores these context-specific influences.

Several analytic strategies are available to evaluate the nature and magnitude of context-specific effects. The traditional approach to context-specific analysis includes the estimation of separate models for different groups or the inclusion of interaction terms among the contextual variable in the general model. However, an alternative type of contextual analysis involves the conjunctive analysis of case configurations. The basic structure of conjunctive analysis and its relative value compared to other methods for studying the situational context of defensive gun use is described below.

The Conjunctive Analysis of Case Configurations

Miethe et al. (2008) recently introduced a technique for exploring the causal relationships among categorical crime data, which they referred to as the conjunctive analysis of case configurations. Conjunctive analysis is similar to qualitative comparative analysis (see Ragin, 1987) in that it takes a case-oriented rather than a variable-oriented analytic approach. Conjunctive analysis assumes that there are multiple causes of the same outcome (i.e., self-defensive gun use) and that any particular variable (i.e., type of crime, whether the offender was armed, time of incident, etc.) may or may not be causally related to an outcome depending on the context and the nature of the other factors associated with an event. Conjunctive analysis can be used in either exploratory or confirmatory research.

The conjunctive analytic approach begins by developing a data matrix table of case configurations that visually represents simultaneously an aggregate compilation of all possible combinations of attributes under consideration (i.e., the contextual factors believed to be associated with effective self-defensive gun use). Once a data matrix table of case configurations is constructed, normative and deviant patterns are identified. Normative situational contexts are those that fall within one standard deviation of the average values for all situations combined, whereas deviant situational contexts are those situations that fall either above or below the overall mean by more than one standard deviation. This approach allows situational attributes that underlie a particular outcome or event to be rank ordered. Because this approach provides a visual representation of the data that is easily interpretable, results of conjunctive

analysis reveal patterns in the data that can be masked by more traditional analytic approaches such as multivariate main-effects regression models.

The Current Study

The current study uses conjunctive analysis to identify the most dominant situational contexts in which a crime victim uses a firearm as a means of self-defense and the prevalence of helping and hurting outcomes within each of these situational contexts. These situational contexts are defined by the conjunctive distribution of all possible combinations of the following situational factors: type of crime, whether an offender was armed with a firearm, the location of the offense, its time of occurrence, and whether an offender was under the influence of drugs/alcohol at the time of the offense.

Two basic research questions underlie the current study. First, what is the nature of the dominant situational contexts in which a crime victim uses a gun self-defensively? Second, what is the relative prevalence of outcomes that help and hurt the situation when self-defensive gun use is employed by a crime victim? The results of this study will then be discussed in terms of their implications for past and future research on self-defensive gun use by crime victims and its outcomes on criminal incidents.

Data and Methods

Data used for the current study are based on the NCVS[1] conducted from 1992 through 2005 that involve a nonfatal violent victimization[2] (unweighted $n = 20{,}631$). A subset of these data that represent victimizations where (a) a victim indicated that he or she used a gun self-defensively during a violent crime and (b) the use of a gun self-defensively either helped or worsened the incident are used for the conjunctive analysis of situational contexts (unweighted $n = 149$). The measurement of the primary variables and the analytic strategy underlying this research are summarized below.

Measurement of Variables

The primary variables in the current study involve measures of self-defensive gun use by crime victims and the situational context of these events. Measures of these concepts are derived from survey questions about the circumstances surrounding criminal victimizations that were identified during NCVS interviews and are consistent with past research that demonstrate the correlation between certain contextual factors and effective self-protective measures by crime victims (see Fisher et al., 2007; Kleck & DeLone, 1993; Kleck & McElrath, 1991; Scott & Beaman, 2004; Siegel et al., 1989; Tark & Kleck, 2004).

Self-Defensive Gun Use and Its Effectiveness

Our measures of self-defensive gun use by crime victims and its relative effectiveness in criminal situations are based on the victim's account of the crime event. This information is derived from an NCVS interview question that asks crime victims if they did "anything with the idea of protecting yourself or your property while the incident was going on?" Self-protective measures, as defined by the NCVS, include the use of physical force toward the offender (i.e., attacking or threatening to attack an offender with a gun, other type of weapon, or without a weapon), resisting or capturing the offender, scaring or warning off the offender, persuading or appeasing the offender, escaping or getting away from the offender, getting help or giving alarm (i.e., calling the police or trying to attract the attention of others), or screaming from pain or fear. Incidents associated with self-defensive gun use represent those cases where respondents indicated they were (a) victims of a crime *and* (b) that they threatened to attack an offender with a gun, attacked an offender with a gun, or fired a gun at an offender.

The perceived effectiveness of self-defensive gun use is measured by the victim's assessment of whether the use of a gun during a crime (i.e., they threatened to attack an offender with a gun, attacked an offender with a gun, or fired a gun at an offender) helped the incident or made it worse. The categories of "neither helped nor worsened" and "both helped and hurt" are also possible responses to this NCVS question. For our analysis of the situational contexts of self-defensive gun use, these categories are used to create two variables: helping outcomes (1 = *actions helped or both helped and hurt*; 0 = *otherwise*) and hurting outcomes (1 = *actions hurt or both helped and hurt*; 0 = *otherwise*). Both outcome variables contain situations where the victim identified his or her actions as being *both* helpful and hurtful. Associating these situations with only one type of outcome would result in either overestimating the positive effects of helpful actions or underestimating the negative effects of self-protective actions that were considered hurtful. In this NCVS sample, 65.5% of the respondents who used guns for self-defense said it "helped," 9.0% said it "hurt," and 7.3% said it both helped and worsened the situation.[3]

Measures of the Situational Context

The situational context for self-defensive gun use is measured in this study by the conjunctive distribution of the categories within each of the following situational factors: type of crime (i.e., 1 = *rape/sexual assaults*, 2 = *personal robberies*, 3 = *physical assaults*); armed offender (0 = *no*, 1 = *yes*); location of offense (0 = *public place*, 1 = *home/private*); time of occurrence (0 = *daytime*, 1 = *nighttime*); and offender drug/alcohol status (0 = *not under the influence*, 1 = *under the influence*).[4]

When the variables described above are considered simultaneously, they represent a total of 48 distinct situational contexts. This total number of situational contexts

is found by multiplying together the number of categories within each variable (i.e., 3 [crimes] × 2 [armed] × 2 [locations] × 2 [time of day] × 2 [offender status] = 48 combinations).

Analytic Approach

The current study involves a conjunctive analysis of the nature of the dominant situational contexts for self-defensive gun use during criminal victimizations. For purposes of identifying normative and deviant patterns of self-defensive gun use, the current study uses the mean and standard deviation to derive empirical boundaries of normative responses within this NCVS sample. In particular, *normative* situational contexts for self-defensive gun use and the contexts associated with helping and hurting outcomes fall within one standard deviation of the average values for all situations combined (i.e., $\bar{x} \pm 1sd$). On the other hand, *deviant* situational contexts are those situations that fall either above (i.e., they are more helpful than average) or below (i.e., they are less helpful than average) the overall mean. By rank ordering situational contexts of self-defensive gun use according to their overall prevalence and their relative distribution of helping and hurting consequences, we are able to identify those particular situational factors that are important for understanding when gun use by victims is most commonly used and most effective.

As a common procedure in conjunctive analysis (see Miethe et al., 2008; Miethe & Regoeczi, 2004; Ragin, 1987), we use a minimum cell frequency of five cases to define nontrivial situational contexts. Based on this minimum frequency rule, the NCVS data in this study contain 42 out of 48 possible distinct situational contexts of violent victimization. A least one case of self-defensive gun use was found in 31 of these 42 contexts.

Results

The Prevalence of Self-Defensive Gun Use Across Situational Contexts

Table 1 is a data matrix of the situational contexts for self-defensive gun use. It visually displays (1) all situational contexts for victimization that are formed by the joint distribution of the contextual factors used in this study and (2) the relative rank ordering of these situational contexts based on the mean prevalence levels of self-defensive gun use within them.

An examination of Table 1 reveals several general patterns about the prevalence of self-defensive gun use across different situational contexts. First, self-defensive gun use is an extremely rare event in the NCVS data. Among the 42 situational contexts with at least 5 incidents of violent victimization, the average rate of self-defensive

Table 1
Situational Factors and the Likelihood That Self-Protective Action Involving a Firearm is Taken

ID	Type of Crime	Offender Armed w/Gun	Private Home	At Night	Offender on Drugs or Alcohol (Known)	Mean	*N*
1	Rape and sexual assault	Yes	Yes	No	Yes	0.17	6
2	Robbery	Yes	Yes	No	No	0.09	11
3	Assault	Yes	No	No	Yes	0.09	55
4	Robbery	Yes	Yes	No	Yes	0.08	13
5	Assault	Yes	No	Yes	Yes	0.07	104
6	Assault	Yes	Yes	No	Yes	0.06	62
7	Assault	Yes	Yes	Yes	Yes	0.05	140
8	Assault	Yes	Yes	Yes	No	0.04	92
9	Robbery	Yes	No	No	No	0.04	47
10	Robbery	No	Yes	Yes	No	0.04	149
11	Assault	Yes	Yes	No	No	0.03	115
12	Robbery	Yes	No	Yes	No	0.03	63
13	Robbery	No	Yes	Yes	Yes	0.03	160
14	Assault	Yes	No	Yes	No	0.03	178
15	Assault	Yes	No	No	No	0.02	230
16	Robbery	No	No	Yes	No	0.01	209
17	Assault	No	Yes	Yes	Yes	0.01	1,745
18	Assault	No	No	Yes	No	0.01	1,705
19	Rape and sexual assault	No	Yes	No	Yes	0.01	88
20	Assault	No	Yes	No	Yes	0.01	1,005
21	Robbery	No	Yes	No	No	0.01	203
22	Robbery	No	No	Yes	Yes	0.01	103
23	Robbery	No	Yes	No	Yes	0.01	114
24	Assault	No	No	Yes	Yes	0.01	1,830
25	Rape and sexual assault	No	No	No	No	0.01	149
26	Robbery	No	No	No	No	0.01	343
27	Assault	No	Yes	Yes	No	0.01	1,557
28	Assault	No	No	No	Yes	*	1,062
29	Rape and sexual assault	No	Yes	Yes	Yes	*	259
30	Assault	No	Yes	No	No	*	2,334
31	Assault	No	No	No	No	*	5,751
32	Rape and sexual assault	No	No	No	Yes	0.00	38
33	Rape and sexual assault	No	No	Yes	No	0.00	92
34	Rape and sexual assault	No	No	Yes	Yes	0.00	109
35	Rape and sexual assault	No	Yes	No	No	0.00	153
36	Rape and sexual assault	No	Yes	Yes	No	0.00	212
37	Rape and sexual assault	Yes	Yes	Yes	Yes	0.00	7
38	Robbery	No	No	No	Yes	0.00	85
39	Robbery	Yes	No	No	Yes	0.00	12
40	Robbery	Yes	No	Yes	Yes	0.00	19
41	Robbery	Yes	Yes	Yes	No	0.00	15
42	Robbery	Yes	Yes	Yes	Yes	0.00	7

Note: The shaded areas represent situational contexts that fall outside the normative range of the mean ±1 standard deviation. A mean of 0 reflects no reported gun use by the victim. For the type of violence categories, rape includes both rape and sexual assault, and assault includes both aggravated and simple assault. Data includes surveys conducted via the National Crime Victimization Survey from 1992 through 2005. Unweighted $n = 20,631$.
*Mean < 0.005.

gun use was only 2.4% with a standard deviation of 3.4%.[5] Second, there is wide variability in the prevalence of defensive gun use across contexts, ranging from a high of 17% (for situational ID #1 in Table 1) to a low of 0% (situational IDs #32 through #42). Third, six "deviant" situational contexts exist in which the likelihood of defensive gun use is one standard deviation above the average rate. These deviant contexts for victims' gun use are always situations in which the offender has a gun and they often involve violent offenses during daytime hours (5 of 6 profiles) and offenders who are perceived as being on drugs or alcohol (5 of 6 profiles).

It is important to note that many of the particular characteristics associated with the highest level of self-defensive gun use are also found in situations in which gun use by crime victims rarely or never occurs. For example, even though armed offenders are always found in the high self-defense situations, there are several situations of rape (ID #37) and robbery (IDs #39 through #42) in which crimes involving armed offenders never result in defensive gun use. The same pattern is observed for the other situational factors examined in this study. Given these context-specific effects, the findings in Table 1 both illustrate and confirm the inadequacy of the main-effect specification of the relationship between each of these variables and the likelihood of defensive gun use.

The Consequences of Self-Defensive Gun Use

Table 2 summarizes the pattern of deviant and normative consequences of self-defensive gun use across different situational contexts. These consequences of defensive gun use are defined by the crime victim as either helping or hurting the incident. Panel A of Table 2 arranges these situational contexts in terms of their prevalence of helping, whereas Panel B ranks them in terms of hurting outcomes. There are a total of 15 distinct situational contexts in Table 2 that satisfy the minimum frequency rule of five incidents (i.e., each of the 15 profiles involves at least 5 cases of defensive gun use that either helped or hurt the incident). The particular characteristics of the normative and deviant situational contexts associated with helping and hurting outcomes are summarized below.

When victims use guns for self-protection, it is far more likely to be perceived as helpful than hurtful across all situations. In fact, the mean level of helping was 92% across these 15 situations of self-defensive gun use ($sd = .10$). As shown in Panel A of Table 2, there are eight distinct situational contexts in which defensive gun use by crime victims *always* helped resolve the incident. No single attribute was found in all of these eight situations; instead, the particular effects of type of crime, whether the offender had a gun, the offense's location, and the time of day were highly contextual, dependent on the particular combination of the other attributes considered conjunctively. Panel A also displays three "deviant" situations of defensive gun use where its prevalence of helping was one standard deviation below the average rate. Most of these deviant situations involved assaults in public locations at night by

Table 2
Situational Contexts of Consequences of Self-Defensive Gun Use

ID	Type of Crime	Offender Armed With Gun	Private Home	At Night	Offender on Drugs or Alcohol (Known)	Helped Mean	*N*
A. Normative and deviant helping responses							
24	Assault	No	No	Yes	Yes	1.00	15
27	Assault	No	Yes	Yes	No	1.00	9
7	Assault	Yes	Yes	Yes	Yes	1.00	7
10	Robbery	No	Yes	Yes	No	1.00	6
13	Robbery	No	Yes	Yes	Yes	1.00	5
28	Assault	No	No	No	Yes	1.00	5
15	Assault	Yes	No	No	No	1.00	5
3	Assault	Yes	No	No	Yes	1.00	5
20	Assault	No	Yes	No	Yes	0.90	10
17	Assault	No	Yes	Yes	Yes	0.87	23
5	Assault	Yes	No	Yes	Yes	0.86	7
31	Assault	No	No	No	No	0.84	19
14	Assault	Yes	No	Yes	No	0.80	5
18	Assault	No	No	Yes	No	0.75	20
30	Assault	No	Yes	No	No	0.75	8
ID	Type of Crime	Offender Armed With Gun	Private Home	At Night	Offender on Drugs or Alcohol (Known)	Hurt Mean	*N*
B. Normative and deviant hurting responses							
10	Assault	No	Yes	Yes	No	0.22	9
14	Assault	Yes	No	Yes	No	0.20	5
13	Assault	No	Yes	Yes	Yes	0.17	23
7	Assault	Yes	Yes	Yes	Yes	0.14	7
30	Assault	No	Yes	No	No	0.13	8
20	Assault	No	Yes	No	Yes	0.10	10
24	Assault	No	No	Yes	Yes	0.07	15
18	Assault	No	No	Yes	No	0.05	20
31	Assault	No	No	No	No	0.05	19
5	Assault	Yes	No	Yes	Yes	0.00	7
10	Robbery	No	Yes	Yes	No	0.00	6
13	Robbery	No	Yes	Yes	Yes	0.00	5
3	Assault	Yes	No	No	Yes	0.00	5
15	Assault	Yes	No	No	No	0.00	5
28	Assault	No	No	No	Yes	0.00	5

Note: In both the panels (A and B), the shaded areas represent situational contexts that fall outside the normative range of the mean ±1 standard deviation. For the type of violence categories, rape includes both rape and sexual assault, and assault includes both aggravated and simple assault. Data includes surveys conducted via the National Crime Victimization Survey from 1992 through 2005. Situation number (ID) represents the rank order of situations based on their relative prevalence of self-defensive gun use (i.e., it is the same ranking number used in Table 1). Unweighted $n = 149$.

offenders who were not thought to be on drugs or alcohol. Even in these situations of relatively low helping outcomes, it is important to note that at least 75% of the victims in these contexts considered their gun use to be helpful.

Across these 15 situations of self-defensive gun use, the average level of hurting responses was 7.5% (*sd* = .08). However, there were three distinct situational contexts in which the rate of perceived hurting was no less than 17% (i.e., beyond +1 *sd* above the mean). These deviant situations of relatively high hurting outcomes *always* involved assaults at night and usually incidents in private homes by an unarmed offender with no known presence of alcohol or drugs. Given that there are also situations of nighttime assaults in which self-defensive gun use rarely or never worsened the incident (e.g., situational IDs #24, #18, and #5), the findings in Panel B also illustrate the limitations of a main-effect specification of the relationship between these variables and the consequences of self-defensive gun use.

Discussion and Implications

Numerous studies over the past two decades have examined the relationship between self-protective actions and the outcome of criminal victimizations (see Azrael & Hemenway, 2000; Cook & Ludwig, 1998; Dizard, Muth, & Andrew, 1999; Hemenway, 1997; Kleck, 1997; Kleck & Gertz, 1995, 1997; Kleck & McElrath, 1991; Kovandzic, Kleck, & Gertz, 1998; Mauser, 1996; McDowall & Wiersema, 1994; Libby & Corzine, 2007; Rand, 1994; Smith & Uchida, 1988; Stolzenberg & D'Alessio, 2000; Tark & Kleck, 2004). Previous studies of self-defensive gun use suggest that these actions may be effective in reducing the likelihood or seriousness of a criminal victimization by increasing the chances that an attempted victimization will not be completed or that the victim will suffer less serious injuries when self-defense is utilized. Although there is a longstanding debate about the relative value of different data sources for measuring the prevalence of self-defensive gun use, the typical analysis often involves a main-effect specification of the relationship between particular situational factors and the outcome of self-defensive action.

The current study is designed to extend this previous research by exploring the nature of the situational contexts of self-defensive gun. Using NCVS data over nearly a 15-year period, we examine the prevalence of self-defensive gun use and its consequences across different situational contexts. The results of our conjunctive analysis of situational contexts and their implications for future research on the prevalence and consequences of self-defensive gun use are described below.

The Prevalence of Self-Defensive Gun Use

Similar to other research examining self-defensive gun use with NCVS data (see Cook & Ludwig, 1998; Cook et al., 1997; Hemenway, 1997; McDowall & Wiersema,

1994; Rand, 1994; Tark & Kleck, 2004), our analysis indicates that victims of violence rarely use a firearm self-defensively during a criminal incident. In fact, we found that only 1% of the over 20,000 violent offenses in this sample involved self-defensive gun use. The average level of self-defensive gun use was also infrequent (i.e., 2%) when the unit of analysis is the 42 situational contexts observed in this study. Even in the most prevalent context for defensive gun use (situational ID #1 in Table 1), only 17% of the victims in these rape situations said that they used a gun for self-protection.

As has been widely recognized (see Cook & Ludwig, 1998; Cook et al., 1997; Kleck, 1997; Kleck & Gertz, 1995; 1997), the low prevalence of self-defensive gun use in the NCVS data may tell us little about the actual level of self-defensive gun use because of the inherent limitations of NCVS data. In particular, self-defense questions in the NCVS are only asked in crime incidents that were either attempted or completed, so acts of self-defensive gun use that deterred entirely the likelihood of a criminal incident would not be included in these data. It is these deterred incidents that are the focus of other surveys (i.e., the NSDS and the National Study of Private Ownership of Firearms; see Kleck & Gertz, 1995; Cook & Ludwig, 1998, respectively). The survey context of asking sensitive questions of gun use may also underestimate the prevalence of defensive action as well.

Regardless of the actual prevalence of gun use by crime victims, the current study nonetheless allows for a comparative analysis of the situational contexts in which they are used and their effectiveness across contexts. From this perspective, our results indicate that the likelihood of defensive gun use varies widely across contexts (from 0% to 17% in some situations) and is most often effective at helping the victim rather than hurting them in those situational contexts in which self-defensive gun use occurs. However, because NCVS data do not include homicide victims (who may have died from unsuccessful self-defensive actions) and may be susceptible to various types of social desirability factors that minimum the expression of negative feelings about one's self-protective actions in general, we would also suggest that our results be viewed as tentative until they are confirmed through other data sources.

Main Effects or Context-Specific Effects

Our conjunctive analysis of the situational contexts of self-defensive gun use assumes that the impact of a particular variable is context-specific rather than constant across contexts. This is the case because conjunctive analysis assumes that it is the particular combination of attributes treated conjunctively rather than in isolation that best represents the functional relationship between independent variables and an outcome variable.

Although a main-effect model is often the functional form that is estimated in previous studies of self-defensive actions and their effectiveness (Fisher et al., 2007; Kleck & DeLone, 1993; Kleck & McElrath, 1991; Kovandzic et al., 1998; Libby &

Corzine, 2007; Scott & Beaman, 2004), our conjunctive analysis clearly reveals the inadequacies of this specification for capturing the nature of these relationships. As shown in Tables 1 and 2, there is no variable in this study that has uniform effects on either the likelihood of self-protective gun use or its effectiveness across contexts. Instead, depending on the particular context, some variables (e.g., the presence of an armed offender, type of crime) may be relatively more helpful or hurtful. It is these types of context-specific effects that are ignored when a main-effect statistical model is estimated.

Limitations and Implications

It is important to note several limitations of the current study that place restrictions on our substantive conclusions. As mentioned previously, the use of NCVS data for estimating the prevalence of self-defensive gun use has been criticized, although we would argue that any available data source on gun use is susceptible to various problems of measurement validity and generalizability. Our study of the situational context is also limited to only five situational factors. Although we selected these particular variables based on availability and previous research (see Fisher et al., 2007; King, 1987; Kleck & DeLone, 1993; Kleck & McElrath, 1991; Miethe & Deibert, 2007; Scott & Beaman, 2004; Tark & Kleck, 2004), future research should consider the contextual analysis of self-protection using other measures as well.

Given these limitations of the current study, we would still suggest that our results have several implications for future research and public policy. For future research, our method of conjunctive analysis is a relatively new approach for examining crime events and their situational context. We think the particular value of this approach is its treatment of multiple causes conjunctively and its visual acuity in identifying patterns of data. For public policy, the results of our conjunctive analysis illustrate the wide variability in the relative prevalence and effectiveness of defensive gun use across contexts. In particular, these findings suggest that the likelihood of gun use and its consequences represent complex social situations that are not easily summarized in terms of a single variable(s) that holds across all contexts. Instead, to understand when self-defensive gun use occurs and is most effective, policy analysts must explore the nature of the different situational contexts which underlie them.

Notes

1. Attempts were made to confirm our results with other data, such as the National Self-Defense Survey (NSDS). Unfortunately, comparable measures of the particular situational factors explored in the current study were not collected in other data sources, limiting the ability to replicate our findings.

2. Nonfatal violent victimizations included attempted or completed rape, sexual assault, robbery, and aggravated and simple assault.

3. In addition, 15.1% of victims said the use of a firearm neither helped nor worsened the incident, 2.9% indicated they did not know how it affected the incident, and .1% of the data were missing. Total does not add to 100% because of rounding.

4. The coding of these situational variables is self-explanatory in most cases by the labels of the categories. However, the coding of each variable requires some clarification. For example, all types of violent crimes include both attempted and completed acts, and the crime category of physical assaults includes both aggravated and simple assaults. The coding of armed offender includes offender armed with a firearm only. Offenders not armed or armed with weapons such as knives, blunt objects and "other" weapons not including a firearm are included in the no category. For the location of the crime, the category home includes offenses that occur within or near the home of the victim or relative/friend. Nighttime is represented by the time frame of 6:00 pm to 6:00 am. An offender's drug or alcohol status is based on the victim's perception as reported.

5. Similar to the level of self-defensive gun use across situational contexts, ~1% of the over 20,000 violent incidents in these NCVS data involved self-defensive gun use. Thus, regardless of the unit of analysis (i.e., incidents or situational contexts), self-defensive gun use is a rare event.

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Timothy C. Hart is an assistant professor in the Department of Criminal Justice at the University of Nevada, Las Vegas, where he also serves as the director of the Center for the Analysis of Crime Statistics. He is the founder and co-editor of *Crime Mapping: A Journal of Research and Practice*, and his areas of interest include survey research, applied statistics, geographic information systems (GIS), and victimization. Prior to joining the faculty at the University of Nevada, he worked as a statistician for the Bureau of Justice Statistics (BJS), a program analyst for the Drug Enforcement Administration (DEA), and a research analyst for the Hillsborough County Sheriff's Office (HCSO).

Terance D. Miethe is a professor in the Criminal Justice Department at the University of Nevada, Las Vegas. His areas of interest include criminology, law, deviance, quantitative methodology, evaluation research, and social psychology. He is the author of several books including *Crime Profiles: The Anatomy of Dangerous Persons, Places, and Situations; Rethinking Homicide: Exploring the Structure and Process Underlying Deadly Situations; The Mismeasure of Crime (Key Questions for Criminal Justice);* and *Simple Statistics: Applications in Social Research*. He was the recipient of the 1999 Barrick Award for Outstanding Faculty Researcher at the University of Nevada.