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PREDICTING SEXUAL ASSAULT PROSECUTION OUTCOMES

The Role of Medical Forensic Evidence Collected by Sexual Assault Nurse Examiners

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Sexual assault prosecution is often influenced by extralegal factors, such as victims' age, race, and prior relationship to the assailant. The importance of evidentiary characteristics remains unclear. Prior studies suggest that victim credibility may be a central concern to law enforcement and prosecutors. However, many communities have implemented interventions to improve the accessibility and quality of medical forensic exams for sexual assault victims. One such intervention, a sexual assault nurse examiner program, was the focus of the current study. The authors examined what factors predicted adult sexual assault case investigation and prosecution in a large Midwestern county with such a program. They compared the predictive utility of victim characteristics, assault characteristics, and forensic medical evidence in explaining case outcomes. Medical forensic evidence collected by the sexual assault nurse examiner program accounted for significant unique variance in case outcomes, above and beyond victim and assault factors.

Keywords: sexual assault; rape; police reporting; prosecution; case outcomes; sexual assault nurse examiner program

Sexual assault is a pervasive but underreported and underprosecuted crime. The National Violence Against Women Survey revealed that only 19% of women assaulted since age 18 reported the assault to law enforcement (Tjaden & Thoennes, 2006). When victims do contact the police, only 18% to 44% of all reported incidents are referred to prosecutors; of those referred reports, prosecutors issue warrants in 46% to 72% of the cases (Bouffard, 2000; Campbell, Wasco, Ahrens, Sefl, & Barnes, 2001; Frazier & Haney, 1996; Spohn, Beichner, & Davis-Frenzel, 2001; Spohn & Horney, 1993). Overall, only 14% to 18% of all reported sexual assaults are prosecuted (for reviews, see Campbell, 2008b; Spohn, 2008). Successful prosecution is not random: certain victims and certain kinds of assaults are more likely to receive systemic attention. "Real rapes," as Estrich (1987) noted, are

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prosecuted because victims are sympathetic and credible and the cases are clear-cut: stranger assaults committed with a weapon, resulting in injuries. A substantial body of research has demonstrated the salience of extralegal factors—that is, factors that are not in the statutes defining the crime or the standards of proof but nevertheless influence case processing. Indeed, victim characteristics can be more influential than assault and evidentiary characteristics in determining legal case outcomes (Feild, 1978; Feild & Bienen, 1980; LaFree, 1989; Reskin & Visher, 1986; Spears & Spohn, 1997).

Much of this literature on sexual assault investigation and prosecution was published in 1980s and 1990s. Since then, there have been significant reform efforts at multiple levels of analysis to try to increase reporting and prosecution. Statutory reforms in the late 1970s and 1980s did not produce the kind of broad-based positive changes that many had hoped for (Matoesian, 1993; Spohn & Horney, 1992). As such, community-based interventions to modify case-processing practices at the local level have recently been developed. To pursue this issue, the current study examined what factors predict adult sexual assault case investigation and prosecution in a large Midwestern county that implemented one of these newer kinds of interventions—namely, a sexual assault nurse examiner (SANE) program. We begin by providing a brief review of prior literature on the factors that predict sexual assault case prosecution, which thus far includes only studies of non-SANE communities. We then explore how the work of SANE programs may affect legal case processing.

VICTIM, ASSAULT, AND FORENSIC EVIDENCE PREDICTORS OF SEXUAL ASSAULT CASE OUTCOMES

Previous research suggests that victim characteristics are highly influential in determining whether a case is prosecuted. Legal system personnel are more likely to pursue cases in which they believe victims will make credible witnesses (Spohn, 2008). Perceived credibility is determined in part by a victim's age, race, and behavior at the time of the assault. For example, younger victims are usually less likely to have their cases prosecuted because legal system personnel often suspect that the reported rape is fabricated to hide consensual sexuality activity (Rose & Randall, 1982; Spears & Spohn, 1997; Spohn & Spears, 1996; cf. Kingsnorth, MacIntosh, & Wentworth, 1999). Prior studies have yielded mixed results regarding whether a victim's race/ethnicity predicts case outcome. Some projects documented no effect (Frazier & Haney, 1996; Kerstetter, 1990; Spears & Spohn, 1997; Spohn & Spears, 1996). However, consistent with theories of racialized case processing (Estrich, 1987; Frohmann, 1997), other studies found that White victims were more likely to have their cases prosecuted (Campbell et al., 2001; Chandler & Torney, 1981; Spohn et al., 2001). Beyond demographics and their sociocultural meanings, police and prosecutors scrutinize victims' behavior at the time of the assault—particularly, alcohol and drug use. Victim substance use significantly decreases the likelihood of case prosecution (Campbell, 1998; Campbell et al., 2001; Spohn & Holleran, 2001; Spohn & Spears, 1996; cf. Frazier & Haney, 1996).

With respect to characteristics of the assault itself, feminist legal theorists have argued that the degree of closeness and intimacy between victim and perpetrator is unduly influential and that crimes between intimates or known parties are less likely to be prosecuted (Russell, 1990; Sanday, 1990; Smart, 1989). Empirical research on the role of the victim–offender relationship has yielded inconsistent results. Stranger assaults are more likely to be thoroughly

investigated and less likely to be unfounded by law enforcement (Bachman, 1998; Kerstetter, 1990; LaFree, 1989; Spohn & Spears, 1996). With respect to prosecutorial charging decisions, older studies indicated that stranger rape cases were more likely to be prosecuted, if the assailant was identified (Bradmiller & Walters, 1985; Chandler & Torney, 1981; Chappell, Geis, & Geis, 1977; Kerstetter, 1990; Rose & Randall, 1982), but more recent work finds no effect (Bachman, 1998; Spohn & Holleran, 2001; Spohn & Horney, 1993). Results regarding offender tactics tend to be more consistent; specifically, the presence of a weapon or the use of force typically increases the probability that a case will move forward through the legal system (Bradmiller & Walters, 1985; Campbell et al., 2001; Kerstetter 1990; LaFree 1981; Rose & Randall, 1982; cf. Frazier & Haney, 1996; Spears & Spohn, 1997).

Evidentiary characteristics may or may not play an important role in case investigation and outcome (Spohn & Holleran, 2001). For instance, strong physical evidence may not matter as much if law enforcement and prosecutors have strong doubts about the victims' perceived credibility (Spears & Spohn, 1997). Alternatively, data suggest that victim characteristics may be less influential, depending on the facts of the case and the available evidence (LaFree, 1989; Reskin & Visher, 1986; Spohn & Cederblom, 1991). In general, cases with corroborating physical evidence, such as physical and/or anogenital injuries, are more likely to move forward through the legal system (Frazier & Haney, 1996; Kerstetter, 1990; Rose & Randall, 1982; Spohn et al., 2001; Spohn & Spears, 1996). However, if victims delay reporting, there may be a doubly negative impact; namely, with the passage of time, physical evidence may be less available, and injury, less detectible (Johnson & Peterson, 2008; Spaulding & Bigbee, 2001), and any hesitancy by victims to engage the criminal justice system may hurt their credibility with legal system personnel (Frohmann, 1997; Kerstetter, 1990; Kingsnorth et al., 1999; Rose & Randall, 1982).

SHIFTING THE BALANCE: THE ROLE OF THE SANE PROGRAM IN SEXUAL ASSAULT CASE OUTCOMES

Despite the mixed findings in this literature, it is fair to conclude that sexual assault case investigation and prosecution are not solely determined by the nature and quality of the evidence linking the assailant to the crime. Although not unique to sexual assault crimes, extralegal factors have substantial power in shaping the criminal justice system's response to sexual violence (Estrich, 1987; Frohmann, 1997; Matoesian, 1993; Russell, 1990; Spohn, 2008). As noted previously, statutory reforms were successful in redefining the laws but did not necessarily bring about change in practice. Therefore, in a second wave of reform efforts, community- and organizational-level interventions have been enacted in an effort to modify local practices (Campbell, 2008a).[1]

One of the most widely implemented community interventions has been the SANE program, whereby highly trained forensic nurses provide comprehensive crisis intervention, medical care, and forensic evidence collection (Campbell, Patterson, & Lichty, 2005). There are nearly 500 SANE programs in the United States. They are staffed by registered nurses or nurse practitioners who have completed a minimum of 40 hr of classroom training and 40 to 96 hr of clinical training, which includes instruction in evidence collection techniques, use of specialized equipment (e.g., colposcope), injury detection methods (e.g., Toluidine blue dye), screening and treatment for pregnancy and sexually

transmitted disease, chain-of-evidence requirements, expert testimony, and sexual assault trauma response (Ledray, 1997, 1999; U.S. Department of Justice, 2006).

Evaluations of SANE programs have found that sexual assault forensic evidence kits collected by SANEs are more complete and accurate than those collected by non-SANE medical personnel (Ledray & Simmelink, 1997; Sievers, Murphy, & Miller, 2003) and that law enforcement personnel are pleased with the quality and reliability of SANE-collected kits (Stone, Henson, & McLaren, 2006). Emerging data from case study designs (Aiken & Speck, 1995; Hutson, 2002; Ledray, 1992; Seneski, 1992) and quasi-experimental designs (Campbell, Bybee, Ford, Patterson, & Ferrell, 2009; Crandall & Helitzer, 2003) suggest that prosecution rates increase in local jurisdictions after the implementation of SANE programs.

SANE programs have the potential to be a valuable resource to law enforcement and prosecutors because the medical evidence collected by SANEs may offer leads that law enforcement can follow up to obtain evidence. Because medical forensic evidence has not been consistently accessible and available to legal system personnel for decades (for reviews, see Campbell et al., 2005; Martin, 2005), it is not entirely surprising that victim and assault characteristics have shown such a strong influence on case outcomes. Yet, it seems unlikely—given the gendered and racialized and classist construction of this crime (see Frohmann, 1998a, 1998b)—that medical forensic evidence would be the sole determining factor in case prosecution. Nevertheless, the evidentiary resources provided by SANE programs may alter the balance of what factors authorities consider in determining investigation and prosecution outcomes.

THE CURRENT STUDY

The purpose of the current study was to examine what factors predict adult sexual assault case investigation and prosecution in a large Midwestern county with a SANE program. Prior research on SANE programs has not examined this issue, which is important because police and prosecutors likely weigh multiple factors in their decision to refer and warrant cases. Therefore, we tested a model that compared the predictive utility of victim characteristics (e.g., race, age), assault characteristics (e.g., victim–offender relationship), and forensic medical evidence (e.g., injury, DNA) in explaining case progression through the criminal justice system. Consistent with prior research, our expectation was that victim and assault characteristics would remain salient and significant predictors of case outcomes. However, the key issue in this study was the relative importance of medical forensics, as indicating a shift in focus from the victim to the evidence supporting the crime. As such, our hypothesis was that after accounting for victim and assault characteristics, forensic medical evidence as provided by the SANEs would explain a significant portion of unique variance in case progression outcomes.

METHOD

RESEARCH SETTING

The setting for this study was a geographically diverse county in the Midwest (including urban, suburban, and rural areas) with a population of 829,453. In 1997, a multidisciplinary

community task force was formed to address the problems of low reporting and conviction rates for sexual assault cases, inadequate forensic evidence collection, and victim-blaming treatment by hospital emergency department personnel. The task force determined that the community needed a SANE program, and in September 1999, the program opened with established agreements from all hospitals and law enforcement agencies in the county to transfer sexual assault victims to the program for evidence collection. In the event that a survivor needed urgent medical care, the SANE program nurses would be permitted to conduct the exams on-site in every county hospital. The programs' clientele is predominately female (97%) and White (68%; with 25% African American, 1% Latina, and 6% other), which is consistent with the racial/ethnic composition of the county. This local SANE program is consistent with emerging national-level data on SANE program characteristics in general, with respect to size, staffing, number of patients served, services provided, and training/supervision of nurses (Campbell et al., 2005; International Association of Forensic Nurses, 2008; Logan, Cole, & Capillo, 2007).

SAMPLE

Adult sexual assault cases that were treated in the focal SANE program during its first 6+ years of operation (September 1999 to December 2005) were sampled according to three criteria: First, the victim was assaulted within the focal county such that all cases would be processed by the same prosecutor's office. Second, the case was investigated by one of the five largest police departments in the county. (There are 23 law enforcement agencies in the focal county, which would require extensive resources for countywide data collection. However, according to Uniform Crime Reports from 1999 to 2005, the largest five agencies handled, on average, 70% of all reported sexual assaults; as such, this sampling still reflects the majority of cases processed in this county.) The third criterion was that a complete medical forensic exam was conducted by SANE program personnel and the exam results were analyzed by the state crime lab for DNA evidence.

The program served 146 victims who met these criteria. Nine cases were eliminated from the sample: One victim was charged with false reporting; two victims recanted their reports; in two stranger rape cases, the offenders were never able to be identified, thus making prosecution impossible; and in four cases, there were missing records regarding final prosecutorial outcome. All of which yielded a final sample size of 137. To assess sampling reliability, 30% of the SANE records were randomly selected and reviewed a second time to determine if the same cases were selected, based on the five eligibility criteria (100% agreement).

PROCEDURE

For all sampled cases, complaint numbers and dates of assault were recorded to search the prosecutors' databases for case outcome data (the dependent variable). For cases that were warranted by the prosecutors, the accuracy of the database was checked against the police records for 30% of the cases to ensure that both sources of information stated that the case had been warranted (100% agreement). For cases not warranted by the prosecutors, police records were checked to clarify whether the case was referred by police to the prosecutors but not warranted or whether it was never referred by law enforcement (100% agreement

between prosecutor database and police records for nonwarranted cases). Complaint numbers and dates of assault were also submitted to the state crime lab, which provided data regarding whether the kit findings were positive, negative, or inconclusive for DNA evidence (an independent variable). For the remaining independent variables, SANE program files were coded for victim, assault, and medical forensic evidence characteristics. Coding was performed by two research assistants and consistently monitored to maintain reliability (kappa > .80; final kappa averaged across all variables = .98). There were no secondary sources against which to compare the accuracy of the victim, assault, and medical forensic evidence characteristics; as such, no validity assessments could be conducted.

MEASURES

The dependent variable for this study was case outcome, which we assessed as an ordinal variable to capture case progression through the criminal justice system:

1 = not referred by the police for prosecution;
2 = referred to the prosecutor but not warranted for prosecution;
3 = warranted by the prosecutor but later dropped or acquitted; and
4 = guilty plea or conviction.

We recognize that the third ordinal category groups two seemingly different scenarios: cases that did go to trial but ended without conviction and those in which the prosecutor began proceeding but later dropped the case. In both situations, prosecutors invested effort in the case and so pursued prosecution, but in the end, there was no conviction. From that perspective, these kinds of cases could logically be combined into the third ordinal level (and indeed, the test of ordinality, described below, empirically supports this decision).

The independent variables were organized into four conceptual blocks. First, the law enforcement agency that handled the case was coded as a control variable (five departments dummy-coded into four variables). Second, victim characteristics that may have affected case outcome were assessed, including the victim's age (dichotomized, 18 to 21 versus 22 and older, which reflected the natural variability in the distribution of this variable), the victim's race (White versus racial/ethnic minority, most of whom were African American), and whether the victim had consumed alcohol or drugs before the assault (yes versus no). Third, assault characteristics were coded, including the relationship of the suspected perpetrator to the victim (family member or partner versus stranger or acquaintance);[2] whether the assault included vaginal, oral, or anal penetration; and the tactics used in the assault, including weapon or force, victim unconscious or drugged, and coercion or intimidation. Fourth, medical forensic evidence gathered by the SANEs was coded, including DNA findings (dichotomized positive versus negative and inconclusive), bruising (physical and/or anogenital), abrasions (physical and/or anogenital), redness (physical and/or anogenital), tears (physical and/or anogenital), and foreign matter. The block also included a dichotomous control variable characterizing the amount of time elapsed between the assault and the medical forensic exam (25% occurring more than 20 hr after the assault versus 75% occurring within 20 hr).

ANALYSIS

Ordinal regression was used to analyze the impact of victim, assault, and medical forensic evidence characteristics on level of case progression through the justice system. Ordinal

regression analyzes the cumulative probability that a case will exceed each of several thresholds, or observed levels of the ordinal outcome variable, as a function of the predictor variables in the analysis. Ordinal regression assumes that odds are proportional—namely, that the effect of a predictor variable is the same across the thresholds, or the levels of the ordinal dependent variable. For example, does a predictor such as *the assault included penetration* have the same effect on (a) convictions/pleas versus lesser dispositions as it does on (b) referrals for prosecution versus nonreferrals?

Although the number of cases was not sufficient for a definitive test of this assumption across all levels of the dependent variable, the limited assessment that was possible revealed no evidence of violation. We used a logit link function in the analysis, given that it was most appropriate to the observed distribution on the dependent variable. As a check on the robustness of the analysis to this choice, we conducted parallel analyses using alternative link functions—namely, a negative log-log and a complementary log-log; these analyses showed virtually identical results.

The ordinal regression was performed in a hierarchical manner; that is, blocks were entered sequentially to control for the effects of earlier variables when examining the effects of later variables. The block order was as follows: control (law enforcement agency), victim characteristics, assault characteristics, and medical forensic evidence. To reduce model complexity and optimize interpretability, variables showing no significant relationship to the dependent variable when entered were trimmed from the model, as recommended by Hosmer and Lemeshow (2000). Likelihood ratio chi-square tests were used to assess the significance of variables in each block to the prediction of the ordinal dependent variable.

RESULTS

Table 1 presents descriptive information regarding victim characteristics, assault characteristics, and medical forensic information for the entire sample ($N = 137$), the subsample of cases not referred by police to prosecutors ($n = 59$), the subsample of cases referred but not warranted by prosecutors ($n = 21$), the subsample of cases warranted but later dropped or acquitted ($n = 18$), and the subsample of cases with guilty pleas or trial convictions ($n = 39$). Consistent with the demographics of the focal county, most victims were Caucasian and in their late twenties ($M = 28.80$). Nearly half of all victims (48%) had consumed alcohol or drugs before the assault. Most victims were sexually assaulted (vaginal penetration) by someone whom they knew (78%). In 62% of the cases, the assailants used weapons or force to complete the attack. In this sample, there was minimal delay between the assault and the medical forensic exam (about 18 hr). Nearly half the evidence kits were positive for DNA. Injury rates varied considerably, but most victims sustained at least one physical or anogenital injury.

Table 2 summarizes results of the ordinal regression. The ordinal effect block describes the expected cumulative probabilities of justice system outcomes at the three thresholds of the ordinal dependent variable, adjusting for the influence of other predictor variables. The odds ratio for Threshold 1 (the odds of a conviction/guilty plea versus a lower outcome) was lower than the odds for Threshold 2 (convicted/plead or warranted and dropped/acquitted versus a lower outcome), which was lower than the odds for Threshold 3 (a higher disposition

TABLE 1: Descriptive Results: Victim, Assault, and Medical Forensic Evidence Characteristics

	Cases Not Referred (n = 59)	*Cases Referred but Not Warranted (n = 21)*	*Cases Warranted but Dropped/Acquitted (n = 18)*	*Cases: Conviction/ Guilty (n = 39)*	*All Cases (n = 137)*
	% (n)	% (n)	% (n)	% (n)	% (n)
Victim characteristics					
Age in years: *M* (*SD*)	30.80 (13.30)	27.33 (15.20)	26.72 (9.86)	27.51 (11.41)	28.80 (12.70)
Race/ethnicity					
Caucasian	84 (48)	81 (17)	94 (16)	87 (34)	86 (115)
Minority	16 (9)	19 (4)	6 (1)	13 (5)	14 (19)
Consumed drugs and/or alcohol	58 (32)	65 (13)	44 (8)	33 (13)	48 (66)
Assault characteristics					
Victim–offender relationship					
Stranger	30 (17)	19 (4)	6 (1)	21 (8)	22 (30)
Intimate/familial	14 (8)	10 (2)	39 (7)	34 (13)	22 (30)
Acquaintance	55 (31)	71 (15)	56 (10)	45 (17)	53 (73)
Type of penetration					
Vaginal	59 (34)	76 (16)	94 (17)	87 (34)	74 (101)
Oral	33 (19)	29 (6)	39 (7)	59 (23)	40 (55)
Anal	24 (14)	33 (7)	44 (8)	28 (11)	29 (40)
Assault tactics					
Weapon/force	58 (34)	43 (9)	72 (13)	74 (28)	62 (84)
Victim unconscious or drugged	31 (18)	29 (6)	17 (3)	16 (6)	24 (33)
Coercion or intimidation	12 (7)	19 (4)	6 (1)	8 (3)	11 (15)
Forensic medical evidence findings					
Delay in exam, in hours: *M* (*SD*)	20.55 (20.66)	18.76 (19.10)	19.58 (23.66)	12.09 (12.83)	17.89 (19.77)
Positive DNA results	40 (22)	37 (7)	59 (10)	66 (25)	47 (64)
Bruising—physical	51 (30)	48 (10)	61 (11)	51 (20)	52 (71)
Bruising—anogenital	10 (6)	5 (1)	17 (3)	10 (4)	10 (14)
Abrasions—physical	44 (26)	19 (4)	33 (6)	49 (19)	40 (55)
Abrasions—anogential	12 (7)	24 (5)	39 (7)	39 (15)	25 (34)
Redness—physical	10 (6)	24 (5)	6 (1)	18 (7)	14 (19)
Redness–anogential	14 (8)	29 (6)	17 (3)	23 (9)	19 (26)
Tears—physical	7 (4)	5 (1)	6 (1)	3 (1)	5 (7)
Tears—anogenital	22 (13)	5 (1)	22 (4)	21 (8)	19 (26)
Foreign matter	9 (5)	24 (5)	17 (3)	18 (7)	15 (20)

TABLE 2: Hierarchical Ordinal Regression Results

	Log Odds	SE	Odds Ratio	Wald (1 df)	95% Confidence Interval		Likelihood Ratio χ^2	df
					Lower	Upper		
Ordinal effect								
Threshold 1: Convicted/plead versus warranted and dropped/acquitted, referred, or not referred	3.98	1.53	53.40**	6.79	0.99	6.97	0.00	0
Threshold 2: Convicted/plead or warranted and dropped/acquitted versus not warranted	4.80	1.55	121.55**	9.66	1.77	7.82		
Threshold 3: Convicted/plead or warranted and dropped/acquitted or referred versus not referred	5.65	1.57	284.15***	13.01	2.58	8.72		
Block 1: Investigating law enforcement agency							11.26*	4
1 versus 5	1.38	0.65	3.99*	4.59	0.12	2.65		
2 versus 5	1.22	0.53	3.40*	5.40	0.19	2.26		
4 versus 5	0.60	0.56	1.83	1.16	–0.50	1.71		
3 versus 5	0.83	0.47	2.29†	3.09	–0.10	1.75		
Block 2: Victim characteristics							8.65*	2
Age 21 or less	0.86	0.37	2.35*	5.27	0.13	1.59		
Victim/survivor had consumed alcohol or drugs	–0.54	0.36	0.58†	2.25	–1.24	0.17		
Block 3: Assault characteristics							17.71***	2
Suspected perpetrator was family member/partner (versus stranger or acquaintance)	1.00	0.44	2.73*	5.20	0.14	1.87		
Penetration (oral, vaginal, and/or anal)	1.81	0.58	6.13**	9.77	0.68	2.95		
Block 4: Sexual assault nurse examiner medical evidence							18.78***	3
Time between assault and medical examination (> 20 hr versus less)	–0.94	0.42	0.39*	4.90	–1.76	–0.11		
DNA evidence found	0.99	0.36	2.68**	7.57	0.28	1.69		
Redness noted (anogenital or physical)	0.86	0.39	2.35*	4.70	0.08	1.63		

Note. $N = 137$. Model goodness-of-fit $\chi^2 = 322.235$, $p = .304$.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

versus not referred for prosecution). Because the variance in the ordinal dependent variable is substantially explained by the predictive variables in the model, the actual values of these coefficients are inflated and so have no interpretive value.

Block 1 in Table 2 shows the relative influence of law enforcement agency on the cumulative probabilities of justice system outcomes at each ordinal threshold. The law enforcement agency used as the reference comparison (Department 5) had the lowest levels of progression through the system; all other police departments had comparatively higher levels. The highest level was found in Department 1, where a case was 3.99 times more likely to reach a higher-level outcome in comparison with a similar case in Department 5. Department 2 had the second-highest level—3.40 times more likely to reach a higher-level outcome. Department 3 was next, at 2.29 times more likely, and Department 4 was closest to Department 5, 1.83 times more likely to attain a higher-level outcome. In comparison with Department 5, Departments 1 and 2 had significantly higher levels of expected case outcomes.

Block 2 of Table 2 shows the influence of victim characteristics. Cases involving victims aged 21 or younger were 2.35 times more likely to reach a higher-level outcome than those involving victims older than 21. Cases in which the victim had consumed alcohol or drugs were only about half as likely to reach higher-level outcomes (odds ratio [OR] = 0.58). Although the coefficient for alcohol/drugs was not significant in the final model, the contribution of this variable was significant before variables in subsequent blocks were added. Further analysis indicated that the variable sharing variance with alcohol/drug use was the amount of time that elapsed between the assault and the medical examination: A slightly higher proportion of cases in which the victim had used alcohol or drugs were examined more than 20 hr after the assault (28.8% versus 22.5%). Race of the victim made no contribution to the model and was therefore dropped before the next block of predictor variables was added.

Block 3 of Table 2 shows the influence of assault characteristics on case progression. Cases in which the suspected perpetrator was a family member or partner of the victim were 2.73 times more likely to reach higher outcome levels compared to cases in which perpetrators were either acquaintances or strangers; outcomes of cases involving strangers or acquaintances was not found to differ in this sample. Cases involving penetration of any type (oral, vaginal, and/or anal) were 6.13 times more likely to reach higher levels of outcome than were cases that did not involve any penetration (i.e., fondling). Outcome was not found to differ by specific type or number of types of penetration. The tactic used in the assault (force/weapon, victim unconscious/drugged, coercion/intimidation) was not predictive of level of outcome after controlling for other variables in this and preceding blocks.

Block 4 of Table 2 shows the contribution of medical forensic evidence to the prediction of case progression through the justice system. Time between the assault and the medical forensic exam was significantly related to case progression: Cases exceeding 20 hr were less than half as likely to reach higher outcome levels (OR = .39). Controlling for time between the assault and the exam, two types of medical forensic evidence were positively related to case progression: DNA evidence was associated with 2.68 greater odds, and a finding of anogenital or physical redness was associated with 2.35 greater odds of higher-level outcome. In this sample, other types of medical forensic evidence (abrasions, tears, bruises, foreign matter) were not associated with case progression. Specific findings, such as anogenital bruising, physical abrasions, and so forth, did not make significant contributions to prediction, at least partly because of their low rates. As can be seen in Table 2, each of the four successive blocks of predictors made a significant contribution to the prediction of case progression.

In light of the small sample, the model was checked for the influence of problematic collinearity, suppression, and overfitting by examining the effects of variables in the final model with other predictors removed. Discrepant findings (e.g., effects reaching significance only when other variables were in the model) might identify suppression and other multivariable effects that are too complex to be supported by the limited sample size. However, the coefficients for all predictors remained consistent regardless of the presence or absence of other variables, thus suggesting that model effects are robust and adequately supported by the sample size.

DISCUSSION

Prior research has consistently found that extralegal factors, such as victim credibility and the degree of intimacy between the victim and the offender, often determine sexual assault case outcomes. In this study, we examined how a community-level reform effort to improve victim services, reporting, and prosecution may alter the balance of the factors that influence law enforcement and prosecutorial decision making. SANE programs were created by the nursing profession to improve medical care and crisis intervention services for survivors, but their dual focus on medical forensics has positioned these programs as potential resources to the legal community. With the consistent availability of high-quality medical forensic exams, DNA testing, and medical documentation, evidentiary characteristics may assume more importance in determining case outcomes than what the literature has traditionally found. However, old habits—particularly, those rooted in gender, race, and class ideologies (Frohmann, 1998a, 1998b)—may be slow to change. Therefore, our goal was to explore what factors predict investigation and prosecution outcomes among sexual assault cases treated in an established SANE program.

Accounting for organizational-level differences across the five law enforcement agencies in the sample, we compared relative contributions of victim, assault, and medical forensic evidence findings in the prediction of case progression. With respect to victim characteristics, survivors between the ages of 18 and 21 (i.e., younger women in the sample) were significantly more likely to have their cases moved to dispositions of higher outcomes. Prior research in non-SANE communities has typically found the opposite effect; specifically, middle-aged women were more likely to have their cases prosecuted (LaFree, 1981; Rose & Randall, 1982; Spears & Spohn, 1997; Spohn & Spears, 1996). However, our results are consistent with those of Kingsnorth and colleagues (1999), who found that cases involving younger women proceeded further through the system. Why this effect is different among SANE cases is unclear and so merits replication; that is, despite their younger age, perhaps these survivors were viewed as being credible for other, unknown reasons. Prior studies have yielded mixed results regarding whether the victims' race/ethnicity predicts case outcome. In this study, we did not find a significant effect. Our sample was predominately White, which is consistent with the racial composition of the focal county; as such, there may not have been sufficient variability to detect an effect, if there was one to be found. Nevertheless, the racial homogeneity of this sample remains a key limitation of the work. However, we did replicate prior findings suggesting that victims' alcohol use before assault significantly decreased the likelihood that the case would be prosecuted (Campbell, 1998; Chandler & Torney, 1981; Frohmann, 1997; Spohn & Spears, 1996).

With respect to assault characteristics, penetration crimes were significantly more likely to be prosecuted; however, the more complicated issue is the effect of the victim–offender relationship, which has yielded inconsistent findings in prior projects. In this study, if the offender was an intimate partner or husband, a former intimate partner or husband, a dating partner, or a family member (i.e., if there was a stronger relationship bond between the victim and the offender), the case was significantly more likely to advance to a level of higher disposition. This finding stands in sharp contrast to feminist legal theories from the 1980 and 1990s (e.g., Russell, 1990; Sanday, 1990; Smart, 1989). Since then, policy makers and practitioners have been quite successful in implementing reforms at multiple levels of analysis. We suspect that our findings may reflect the substantial efforts of the domestic violence advocacy community to have intimate partner crimes recognized and prosecuted by the criminal justice system (see Salazar, Emshoff, Baker, & Crowley, 2007). Intimate-partner sexual assaults might be captured by mandatory prosecution policies (or similar pro-prosecution efforts in domestic violence cases) that otherwise miss sexual assaults from "less intimate" acquaintances. After accounting for these victim and assault characteristics, medical forensic evidence could still predict significant variance in case outcomes. In other words, what determined whether SANE-treated cases would proceed through the criminal justice system was not solely based on features of the survivor and/or the assault. Not surprisingly, when there was a greater delay between the time of the assault and the time that the survivor had the medical forensic exam, the case was less likely to progress through the system. Perhaps with more delay, there was less remaining evidence of the assault; it could also be that law enforcement continues to question the veracity of survivors who do not immediately seek help (Frohmann, 1997; Kerstetter, 1990). Positive DNA evidence significantly increased the likelihood of case progression, but the effect of specific injuries was difficult to discern. Our data were coded at a micro-level, distinguishing between multiple types of physical injuries and anogential injuries. However, many survivors do not sustain injuries from the assault; hence, we had low base rates on nearly all injuries that we attempted to include in the statistical models. We did find an effect in which physical or anogential redness was associated with increased likelihood of case progression, which may have been influential if redness was perceived as an indicator of force. A substantially larger sample size may be needed to test the predictive influence of specific injuries, given their low base rate occurrence. The small sample size of this study was sufficient for obtaining robust model effects, but a limitation lies in its inability to speak to the importance of specific anogenital and physical injuries (other than redness).

The scope of this study did not include the examination of another set of critical factors that may influence investigation and prosecution outcomes—namely, the attitudes, decision-making processes, and behaviors of law enforcement personnel and prosecutors. Prior research has found that police officers' demographics and attitudes shape their course of action in sexual assault investigations (and in other crimes as well; Campbell & Johnson, 1997; Eitle, Stolzenberg, & D'Alessio, 2005; Meier & Crotty-Nicholson, 2006; Page, 2008). Therefore, a fruitful line of inquiry would be to examine the intersections between police and prosecutor characteristics and victim, assault, and medical forensic evidence factors. Particular victim or case features may be more or less salient for some personnel of the legal system in their decision-making processes.

The conclusions that we can draw from this study are limited by our use of a cross-sectional design. Nevertheless, our findings, relative to previously published studies,

suggest some shifting in the relative importance of the factors evaluated by police and prosecutors. Whereas victim and assault characteristics remained salient, model fit was optimal when medical forensic factors were also included. In other words, prediction of case outcomes was best achieved by the inclusion of medical forensic evidence factors. We acknowledge that the term *shifting* implies longitudinal change and that our data provide only cross-sectional exploratory findings that require replication. Indeed, we had planned to examine what factors predict case progression for both pre- and post-SANE cases. Unfortunately, despite extensive efforts, we were not able to obtain victim, assault, and medical forensic evidence information for pre-SANE cases in this community. Because of HIPAA restrictions (i.e., Health Insurance Portability and Accountability Act), medical forensic exam records were not directly available from the county hospitals; thus, we requested police records because they should contain copies of the hospital records (given that this documentation can serve as evidence for the case). However, the police records and detective reports did not consistently contain this information; in fact, it was almost always missing (as it was when we checked prosecutor records as well). Official crime databases were also woefully incomplete regarding medical forensic information.

With these options exhausted, we conducted qualitative interviews with nine key informants of law enforcement (five lead detectives and four supervisors of detectives) and all six prosecutors in the county's sex crimes unit about the utility of medical forensic evidence in the pre-SANE era. All participants stated that they were not surprised that we had had trouble obtaining medical forensic exam reports, because before the implementation of the SANE program, this information was largely inaccessible to members of the legal community as well. Hospital personnel were reluctant to provide documentation, and when reports were available, law enforcement and prosecutors described them as being of mixed quality at best. Medical forensic information was not part of the police files, because they did not have it; therefore, it could not be used in the development of the investigation or the prosecution case. To some extent, this point further underscores the utility of the SANE program, given that we consistently found reports of the SANE nurses in the post-SANE police files. These qualitative accounts suggest that key legal personnel in this community have undoubtedly perceived a shift over time in the availability, accessibility, and quality of medical forensic evidence with the implementation of the SANE program. Nevertheless, our quantitative exploration of what factors predict case progression could only be examined among post-SANE cases.

Building on these findings, much of the conventional wisdom regarding sexual assault case prosecution should be reexamined in the context of new community-level interventions, such as SANE programs, sexual assault response teams (National Sexual Violence Resource Center, 2006), and organizational-level reforms (e.g., specialized investigation units and vertical prosecution policies; for a review, see Spohn, 2008). In light of the sparse literature on these interventions, it is entirely premature to conclude that reform efforts to change local police and prosecutor practices have been effective, but the findings of this study and others highlight the importance of systematically studying local context. Interventions that can provide useful resources to the ever-resource-strapped criminal justice system may be able change the number and type of reported sexual assaults prosecuted by that system.

NOTES

1. It is beyond the scope of this article to review organizational-level reforms, such as specialized police and prosecutor units; for a review of these interventions, see Spohn (2008).

2. We recognize that it is unconventional to combine stranger and acquaintance sexual assault into a single referent category; however, preliminary bivariate analyses revealed that intimate partner/family assaults were clearly linked to higher case progression. Given the study's sample size, a parsimonious multivariate model was essential; therefore, we used one variable to reflect the victim–offender relationship, rather than two dummy-coded variables.

REFERENCES

Aiken, M. M., & Speck, P. M. (1995). Sexual assault and multiple trauma: A sexual assault nurse examiner (SANE) challenge. *Journal of Emergency Nursing, 2*, 466-468.

Bachman, R. (1998). The factors related to rape reporting behavior and arrest: New evidence from the National Crime Victimization Survey. *Criminal Justice and Behavior, 25*, 8-29.

Bouffard, J. (2000). Predicting type of sexual assault case closure from victim, suspect and case characteristics. *Journal of Criminal Justice*, *28*, 527-542.

Bradmiller, L. L., & Walters, W. S. (1985). Seriousness of sexual assault charges: Influence factors. *Criminal Justice and Behavior*, *12*, 463-484.

Campbell, R. (1998). The community response to rape: Victims' experiences with the legal, medical and mental health systems. *American Journal of Community Psychology*, *25*, 355-379.

Campbell, R. (2008a). *Multidisciplinary responses to sexual violence crimes: A review of the impact of SANE and SARTs on criminal prosecution*. Paper presented at the National Institute of Justice Sexual Violence Research Workshop, Washington, DC.

Campbell, R. (2008b). The psychological impact of rape victims' experiences with the legal, medical, and mental health systems. *American Psychologist*, *68*, 702-717.

Campbell, R., Bybee, D., Ford, J. K., Patterson, D., & Ferrell, J. (2009). *A systems change analysis of SANE programs: Identifying the mediating mechanisms of criminal justice system impact*. Washington, DC: National Institute of Justice.

Campbell, R., & Johnson, C. R. (1997). Police officers' perceptions of rape: Is there consistency between state law and individual beliefs? *Journal of Interpersonal Violence, 12*, 255-274.

Campbell, R., Patterson, D., & Lichty, L. F. (2005). The effectiveness of sexual assault nurse examiner (SANE) program: A review of psychological, medical, legal, and community outcomes. *Trauma, Violence, & Abuse: A Review Journal, 6,* 313-329.

Campbell, R., Townsend, S. M., Long, S. M., Kinnison, K. E., Pulley, E. M., Adames, S. B., et al. (2005). Organizational characteristics of sexual assault nurse examiner programs: Results from the national survey of SANE programs. *Journal of Forensic Nursing, 1,* 57-64.

Campbell, R., Wasco, S. M., Ahrens, C. E., Sefl, T., & Barnes, H. E. (2001). Preventing the "second rape": Rape survivors' experiences with community service providers. *Journal of Interpersonal Violence, 16*, 1239-1259.

Chandler, S. M., & Torney, M. (1981). The decisions and the processing of rape victims through the criminal justice system. *California Sociologist*, *4*, 155-169.

Chappell, D., Geis, R., & Geis, G. (1977). *Forcible rape: The crime, the victim, and the offender*. New York: Columbia University Press.

Crandall, C., & Helitzer, D. (2003). *Impact evaluation of a sexual assault nurse examiner (SANE) program* (NIJ Document No. 203276). Washington, DC: National Institute of Justice.

Eitle, D., Stolzenberg, L., & D'Alessio, S. J. (2005). Police organizational factors, the racial composition of the police, and the probability of arrest. *Justice Quarterly, 22*, 30-57.

Estrich, S. (1987). *Real rape*. Cambridge, MA: Harvard University Press.

Feild, H. (1978). Attitudes toward rape: A comparative analysis of police, rapists, crisis counselors, and citizens. *Journal of Personality and Social Psychology, 36,* 156-179.

Feild, H., & Bienen, L. (1980). *Jurors and rape: A study in psychology and law.* Lexington, MA: Lexington Books.

Frazier, P., & Haney, B. (1996). Sexual assault cases in the legal system: Police, prosecutor and victim perspectives. *Law and Human Behavior, 20*, 607-628.

Frohmann, L. (1997). Discrediting victims' allegations of sexual assault: Prosecutorial accounts of case rejections. *Social Problems, 38,* 213-226.

Frohmann, L. (1998a). Constituting power in sexual assault cases: Prosecutorial strategies for victim management. *Social Problems, 45*, 393-407.

Frohmann, L. (1998b). Convictability and discordant locales: Reproducing race, class, and gender ideologies in prosecutorial decision making. *Law and Society Review, 31*, 531-555.

Hosmer, D. W., & Lemeshow, S. (2000). *Applied logistic regression* (2nd ed.). New York: Wiley.
Hutson, L. A. (2002). Development of sexual assault nurse examiner programs. *Emergency Nursing, 37*, 79-88.
International Association of Forensic Nurses. (2008). [Database]. Accessed May 9, 2008, at http://www.forensicnurse.org
Johnson, D., & Peterson, J. (2008). *Forensic science evidence and sexual violence*. Paper presented at the National Institute of Justice Sexual Violence Research Workshop. Washington, DC.
Kerstetter, W. (1990). Gateway to justice: Police and prosecutor response to sexual assault against women. *Journal of Criminal Law & Criminology, 81,* 267-313.
Kingsnorth, R., MacIntosh, R., & Wentworth, J. (1999). Sexual assault: The role of prior relationship and victim characteristics in case processing. *Justice Quarterly, 16,* 275-302.
LaFree, G. (1981). Official reactions to social problems: Police decisions in sexual assault cases. *Social Problems, 28,* 582-594.
LaFree, G. (1989). *Rape and criminal justice.* Belmont, CA: Wadsworth.
Ledray, L. (1992). The sexual assault nurse clinician: A fifteen-year experience in Minneapolis. *Journal of Emergency Nursing, 18*, 217-222.
Ledray, L. (1997). SANE program staff: Selection, training, and salaries. *Journal of Emergency Nursing, 23*, 491-495.
Ledray, L. (1999). *Sexual assault nurse examiner (SANE) development and operations guide*. Washington, DC: U.S. Department of Justice, Office for Victims of Crime.
Ledray, L., & Simmelink, K. (1997). Efficacy of SANE evidence collection: A Minnesota study. *Journal of Emergency Nursing*, *23*, 75-77.
Logan, T., Cole, J., & Capillo, A. (2007). Sexual assault nurse examiner program characteristics, barriers, and lessons learned. *Journal of Forensic Nursing, 3*, 24-34.
Martin, P. Y. (2005). *Rape work: Victims, gender, and emotions in organization and community context*. New York: Routledge.
Matoesian, G. M. (1993). *Reproducing rape: Domination through talk in the courtroom*. Chicago: University of Chicago Press.
Meier, K. J., & Crotty-Nicholson, J. (2006). Gender, representative bureaucracy, and law enforcement: The case of sexual assault. *Public Administration Review, 66*, 850-860.
National Sexual Violence Resource Center. (2006). *Report on the national needs assessment of sexual assault response teams*. Harrisburg, PA: Author.
Page, A. D. (2008). Gateway to reform? Policy implications of police officers' attitudes toward rape. *American Journal of Criminal Justice, 33*, 44-58.
Reskin, B., & Visher, C. (1986). The impacts of evidence and extralegal factors in jurors' decisions. *Law & Society Review, 20,* 423-438.
Rose, V., & Randall, S. (1982). The impact of investigator perceptions of victim legitimacy on the processing of rape/sexual assault cases. *Symbolic Interaction, 5*, 23-36.
Russell, D. E. H. (1990). *Rape in marriage* (2nd ed.). New York: Macmillan.
Salazar, L. F., Emshoff, J. G., Baker, C. K., & Crowley, T. (2007). Examining the behavior of a system: An outcome evaluation of a coordinated community response to domestic violence. *Journal of Family Violence, 22*, 631-641.
Sanday, P. R. (1990). *Fraternity gang rape: Sex, brotherhood, and privilege on campus*. New York: New York University Press.
Seneski, P. (1992). Multi-disciplinary program helps sexual assault victims. *American College of Physician Executives*, 417-418.
Sievers, V., Murphy, S., & Miller, J. (2003). Sexual assault evidence collection more accurate when completed by sexual assault nurse examiners: Colorado's experience. *Journal of Emergency Nursing, 29*, 511-514.
Smart, C. (1989). *Feminism and the power of law*. London: Routledge.
Spaulding, R., & Bigbee, P. (2001). Evidence recovery considerations in sexual assault investigations. In R. Hazelhood & A. Burgess (Eds.), *Practical aspects of rape investigation: A multidisciplinary approach* (3rd ed.). Washington DC: CRC Press.
Spears, J., & Spohn, C. (1997). The effect of evidence factors and victim characteristics on prosecutors' charging decisions in sexual assault cases. *Justice Quarterly, 14*, 501-524.
Spohn, C. (2008). *The criminal justice system's response to sexual violence.* Paper presented at the National Institute of Justice Sexual Violence Research Workshop, Washington, DC.
Spohn, C., Beichner, D., & Davis-Frenzel, E. (2001). Prosecutorial justifications for sexual assault case rejection: Guarding the "gateway to justice." *Social Problems, 48*, 206-235.
Spohn, C., & Cederblom, J. (1991). Race and disparities in sentencing: A test of the liberation hypothesis. *Justice Quarterly, 8*, 305-327.
Spohn, C., & Holleran, D. (2001). Prosecuting sexual assault: A comparison of charging decisions in sexual assault cases involving strangers, acquaintances, and intimate partners. *Justice Quarterly, 18*, 651-688.
Spohn, C., & Homey, J. (1992). *Rape law reform: A grassroots revolution and its impact*. New York: Plenum.
Spohn, C., & Horney, J. (1993). Rape law reform and the effect of victim characteristics on case processing. *Journal of Quantitative Criminology, 9,* 383-409.

Spohn, C., & Spears, J. (1996). The effect of offender and victim characteristics on sexual assault case processing decisions. *Justice Quarterly, 13,* 649-679.

Stone, W. E., Henson, V. H., & McLaren, J. A. (2006). Law enforcement perceptions of sexual assault nurses in Texas. *Southwest Journal of Criminal Justice, 3*, 103-126.

Tjaden, P., & Thoennes, N. (2006). *Extent, nature, and consequences of rape victimization: Findings from the National Violence Against Women Survey* (NIJ No. 210346). Washington, DC: National Institute of Justice.

U.S. Department of Justice. (2006). *National training standards for sexual assault medical forensic examiners*. Washington, DC: Author.

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