

STRUCTURAL MODELS OF THE RELATIONS OF ASSAULT SEVERITY, SOCIAL SUPPORT, AVOIDANCE COPING, SELF-BLAME, AND PTSD AMONG SEXUAL ASSAULT SURVIVORS

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A number of studies have identified which survivors of sexual assault are more likely to develop symptoms of posttraumatic stress disorder (PTSD). Most correlates that have been identified have been at the individual level. Insufficient attention has been given to whether survivors' social interactions impact their individual responses to assault and subsequent levels of psychological symptomatology. In this study, a large, diverse sample of community-residing women ($N = 636$) was surveyed. Structural equation modeling was used to examine the relationships between assault severity, global support, negative social reactions, avoidance coping, self-blame, traumatic life experiences, and PTSD symptoms. The results suggest that negative social reactions and avoidance coping are the strongest correlates of PTSD symptoms and that the association typically observed between victim self-blame and PTSD symptoms may be partially due to the effect of negative social reactions from others. These reactions may contribute to both self-blame and PTSD. Implications for future research and clinical practice are discussed.

Researchers have identified numerous psychological effects of sexual assault on women. Burgess and Holmstrom's (1974) classic study first described rape trauma syndrome in rape survivors, and more recent studies have documented various psychological consequences of rape (e.g., depression, anxiety, sexual problems) including posttraumatic stress disorder (PTSD; see Foa & Riggs, 1993; Frieze, 2005; Resick, 1993, for reviews). In a national probability sample, 31% of female rape victims had developed PTSD at some time in their lives in contrast with only 5% of women who had never been victims of crime (Kilpatrick, Edmunds, & Seymour, 1992), suggesting that PTSD is a common consequence of sexual assault. However, not all

survivors of sexual assault develop PTSD. To better understand women's responses to sexual assault, studies have been conducted to identify which survivors of sexual assault are more likely to develop symptoms. Correlates of PTSD that have been identified include assault severity measures such as offender violence, severity of sexual acts, and physical injury (Bownes, O'Gorman, & Sayers, 1991; Kilpatrick, Saunders, Amick-McMullan, & Best, 1989; Ullman & Filipas, 2001); self-blame attributions (Frazier, 2003; Koss, Figueredo, & Prince, 2002; Ullman, 1997); multiple sexual victimization (Elliott, Mok, & Briere, 2004; Ullman & Brecklin, 2002); and avoidance coping (Cohen & Roth, 1987; Santello & Leitenberg, 1993; Valentiner, Riggs, Foa, & Gershuny, 1996). Inconsistent results have been found for demographic characteristics of age, education, and ethnicity (Frazier et al., 1997; Ullman & Filipas, 2001), as well as relationship to the perpetrator (Foa & Riggs, 1993; Resick, 1993).

By focusing disproportionately on individual background and assault-specific factors, past studies assume that recovery from rape occurs primarily within individuals or is determined by characteristics of the assault. This limitation in empirical studies of PTSD in rape victims has continued despite early recognition of the "second injury" that occurs when rape victims are blamed and rejected by others after the assault (Burgess & Holmstrom, 1978;

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Symonds, 1980). In contrast to the more individualistic clinical models of rape impact that have prevailed since the PTSD diagnosis was first included in the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1980), a more contextual approach to PTSD locates the likelihood of a disorder in a population as a function of environmental factors such as stressors, risk factors in the environment, socialization practices, social support resources, and opportunities for connectedness (Elias, 1987). Consideration of these factors is critically important in light of a recent meta-analysis of 14 risk factors for PTSD across a variety of trauma types that found social support to have the strongest effect size (Brewin, Andrews, & Valentine, 2000). More recently, contextual approaches to sexual assault are seen in studies examining how persons considered as informal support respond to survivors (Ahrens & Campbell, 2000), survivors' experiences with community service providers (Campbell, 1998; Campbell, Wasco, Ahrens, Seftl, & Barnes, 2001; Logan, Evans, Stevenson, & Jordan, 2005), police officers' perceptions of rape (Campbell & Johnson, 1997), and ecological models of sexual assault (Grauerholz, 2000; Heise, 1998). These more comprehensive approaches to sexual assault address how aspects of survivors' social contexts may influence their individual responses and recovery.

No large-scale studies have integrated contextual factors with individual and assault variables to examine how they may interrelate in understanding recovery. Such studies are needed to gain insight into the pathways by which social responses may influence the ways that survivors cope with and attribute blame for sexual assault. Past research on samples of community-residing women has shown that negative social reactions from others (e.g., blame, stigma, having others take control of one's decisions) are related to PTSD symptoms in sexual assault survivors (Campbell et al., 1999; Ullman, 1996; Ullman & Filipas, 2001). These findings regarding the harmful effects of negative social reactions are important, especially because positive social reactions to disclosure of assault and social support in general have weak or nonsignificant effects on recovery (see Ullman, 1999, for a review).

Studies have also shown that negative social reactions affect victims' individual responses to rape. Ullman (1996) found that negative social reactions were associated with more reliance on avoidance coping (e.g., withdrawal, trying to forget the assault) and greater characterological self-blame in sexual assault victims. Both avoidance coping and greater self-blame by victims have been shown to be related to greater PTSD symptoms in studies of rape victims that did not look at social support or negative social reactions (Koss et al., 2002; Frazier, 2003; Valentiner et al., 1996). Studies also show that more severe sexual assaults characterized by greater offender violence, more physical injuries, and completed sexual acts are associated with receiving more negative social reactions from others after disclosing assault (Ullman, 2000; Ullman & Siegel, 1995). Fur-

thermore, smaller longitudinal studies of treatment-seeking victims have shown that unsupportive reactions and more interpersonal friction with others following assault predict worse PTSD symptoms at follow-up (Andrews, Brewin, & Rose, 2003; Zoellner, Foa, & Brigidi, 1999). Taken together, this accumulating body of evidence provides guidance for specifying a model of the interrelationships of social support, individual responses, and psychological symptoms of PTSD.

Given the lack of large-scale studies integrating all of these factors, the present study's purpose was to develop and test such a model of individual, assault-related, and contextual factors to better understand how all of these variables may interrelate in affecting PTSD symptoms following sexual assault. The initial model that was tested integrates several constructs: assault severity, global support, assault-specific social reactions, self-blame, avoidance coping, and other traumatic life experiences. Each of these constructs is described below as well as its role in the proposed model.

Assault Severity

Assault severity (e.g., degree of offender violence, physical injury, severity of sexual victimization) has been related to increased PTSD symptoms in sexual assault victims (Kilpatrick et al., 1989; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993; Ullman & Filipas, 2001). Therefore, a positive, direct relationship between assault severity and PTSD symptoms was hypothesized. Additionally, the hypothesized model predicts a negative relationship between assault severity and self-blame. This relationship was expected due to prior findings that women perceive more severe assaults to be more legitimate and are more likely to acknowledge that they were raped (Fisher, Daigle, Cullen, & Turner, 2003). This recognition should lead to fewer feelings of self-blame for rape. Consistent with this line of reasoning, prior findings have indicated that rapes that are not acknowledged as such are associated with higher levels of behavioral and characterological self-blame (Frazier & Seales, 1997). The model also predicts a positive relationship between assault severity and negative social reactions. It might be expected that women who experience greater degrees of violence would receive fewer negative social reactions from others because the assaults conform to stereotypes of what constitutes "real rape" (Estrich, 1987). However, previous research has found that the opposite is true (Ullman, 2000; Ullman & Siegel, 1995). These findings may be explained in part by the fact that victims of more severe assaults disclose assault more frequently, which may lead to more opportunities for negative social reactions to be expressed.

Global Social Support

Social support consists of interpersonal connections and exchanges that are perceived as helpful (Rudkin, 2003). The

number of confidantes women have, the frequency of their contact, and how they perceive themselves as getting along with others are all indicators of quality and quantity of one's social support network. There are multiple models of the relationship between social support and psychological distress and well-being (see review in Barrera, 2000). One model involves social support having a direct effect on psychological distress. Direct effects of social support have been found in several studies with both prospective and cross-sectional designs (e.g., Lin & Ensel, 1985; Williams, Ware, & Donald, 1981). In studies of sexual assault survivors, available evidence suggests a small positive effect of global support on psychological symptoms, although many researchers have not assessed global support or failed to use standardized measures (see review in Ullman, 1999). Therefore, this construct is examined as a correlate of PTSD symptoms to help clarify this relationship.

Assault-Specific Negative Social Reactions

Although a survivor may have a high level of social support when coping with life issues generally, her support system may fail her in providing assault-specific supportive responses to assault disclosure. Theoretically, negative social reactions are an important, yet understudied, aspect of social support that can affect health and mental health outcomes for victims of many stressful life events and stigmatizing conditions, including rape (for reviews, see Herbert & Dunkel-Schetter, 1992; Ullman, 1999). Several studies have shown that negative social reactions such as being blamed, disbelieved, and treated differently (e.g., stigmatized) are related to more psychological symptoms (e.g., Campbell et al., 1999; Campbell et al., 2001; Davis, Brickman, & Baker, 1991; McAuslan & Abbey, 1998; Ullman, 1996). One of the most comprehensive attempts to capture assault-specific reactions has been the development of the Social Reactions Questionnaire (SRQ; Ullman, 2000). In addition to assessing several aspects of supportive behavior such as emotional support, instrumental support, and information support, this measure also assesses five aspects of negative social reactions: taking control of the victim's decisions (e.g., treating her as though she cannot take care of herself), victim blame, treating the victim differently (e.g., withdrawing from her), distraction (e.g., discouraging her from talking about the assault), and egocentric responses (e.g., responses that put the support provider's needs over the victim's needs). Research using this standardized measure has shown that receiving more negative social reactions is related to greater PTSD symptom severity (Campbell et al., 1999; Ullman, 2000; Ullman & Filipas, 2001).

In addition to a positive relationship between negative social reactions and PTSD symptoms, past research has found evidence that negative social reactions are correlated with more avoidance coping and that the association of negative reactions with greater psychological symptoms is mediated by avoidance coping (Ullman, 1996). Negative social reactions may lead survivors to disengage by not talking

about the assault and/or withdrawing from others to avoid more secondary victimization. The hypothesized model also predicts a positive relationship between negative social reactions and self-blame. Theoretically, reactions from other people may affect the degree to which self-blaming attitudes are reinforced in a survivor's appraisal of the experience. At least one study has shown that negative social reactions are related to greater self-blame in sexual assault victims (Ullman, 1996).

Self-Blame

As advocates for victims have long recognized, to make sense of the assault, survivors must make attributions for why the assault occurred. Of particular interest in the present study are two types of self-blame attributions: behavioral and characterological self-blame. As Janoff-Bulman (1979) originally proposed, behavioral self-blame reflects survivors' belief that their own behavior led to the assault. Characterological self-blame focuses not on behavior but on the survivor's personality or character as the cause of rape. These forms of self-blame are important because they have been found to be strongly related to recovery outcomes, particularly greater PTSD symptoms in rape victims (Frazier, 1990, 2003; Frazier & Schauben, 1994; Koss et al., 2002; Ullman, 1997). However, the present study tests a more complex model in which the effect of negative social reactions on assault-related PTSD is expected to be mediated by survivors' degree of self-blame, including both behavioral and characterological forms. Victims may turn to others when disclosing assault to make sense of what has happened to them. Theoretically, if a survivor's social network responds by blaming her for the assault, one would expect her self-blame to be greater than if she is not blamed by others. Past empirical research examining negative social reactions and self-blame separately shows significant effects of each on PTSD symptoms, which suggests that studies need to control for both variables and to examine their interrelationship when investigating their relationships with PTSD. There are two reasons that we examine how negative social reactions may lead to more self-blame. First, past research testing alternate path models showed that negative social reactions are related to more characterological self-blame (Ullman, 1996). Second, based on early theory that these negative reactions constitute a second injury to victims (Symonds, 1980), it makes some sense to argue that self-blame may arise and/or be reinforced by initial negative reactions from others when victims disclose sexual assaults.

Avoidance Coping

A common response to traumatic life events including rape is engaging in some form of avoidance coping or attempts to avoid or reduce negative affect. Overwhelming affect resulting from trauma exposure may lead victims to engage in efforts to avoid distressing thoughts and feelings about the trauma, especially shortly after the experience (Foa & Riggs, 1995). Although these responses may be

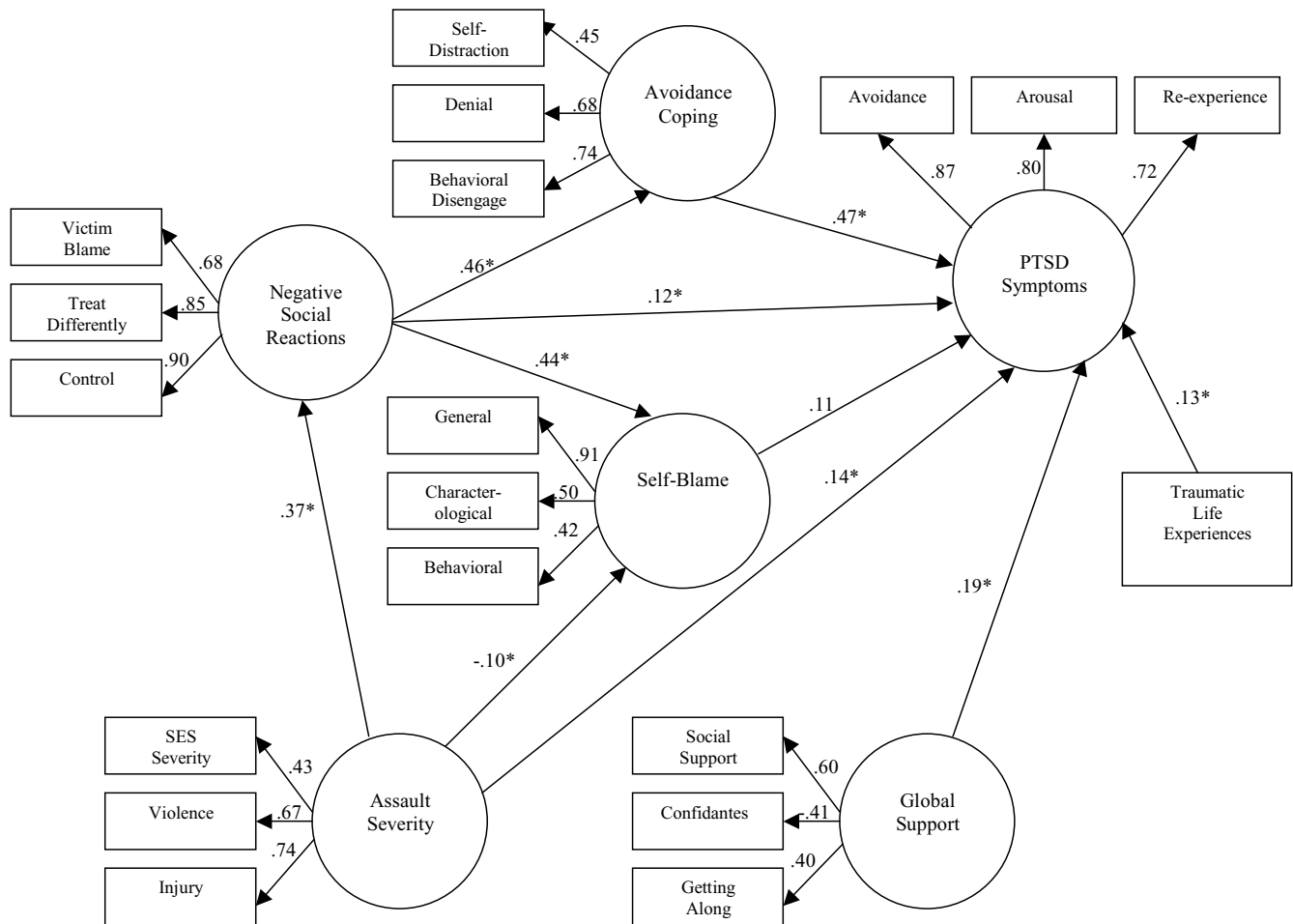


Fig. 1. Hypothesized model of relationships of social support, coping, and self-blame in relation to PTSD symptoms. This model includes correlated disturbance terms for avoidance coping and self-blame ($b = .61^*$) and correlated error terms for characterological and behavioral self-blame ($b = .44^*$) not shown in the figure. $*p < .05$.

adaptive in the short term for navigating the crisis period after trauma occurs, it is believed that ongoing avoidance coping may be associated with greater psychological trauma in the long term, because to process the event, one must acknowledge and work through thoughts and feelings related to it (Resick & Schnicke, 1993). Strategies such as distraction, disengagement with a stressor, denial, and social withdrawal are all forms of avoidance coping, some of which have been found to be related to greater distress in sexual assault survivors (Arata, 1999; Burt & Katz, 1988; Frazier & Burnett, 1994; Frazier, Mortenson, & Steward, 2005; Meyer & Taylor, 1986; Valentiner et al., 1996). Unfortunately, such strategies, although a normal protective response to severe stressors, may be ineffective. Past research shows that use of avoidance coping is related to poorer recovery. A number of studies have shown that avoidance coping strategies of withdrawal, behavioral disengagement, and denial are associated with poorer psychological outcomes for rape victims, including PTSD (Cohen & Roth, 1987; Frazier et al., 2005; Santello & Leitenberg, 1993; Ullman, 1996; Valentiner et al., 1996). Therefore, in this

study avoidance coping was hypothesized to be positively related to PTSD symptoms. As mentioned previously, it was also expected, based on past findings, that part of the effect of negative social reactions on psychological symptoms would be mediated by avoidance coping (Ullman, 1996).

Trauma History

Research shows that traumatic events are related to PTSD (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Resnick et al., 1993) and that a greater number of prior traumas increases the likelihood of PTSD symptoms in women (Green et al., 2000) and in sexual assault victims (Koss et al., 2002; Nishith, Mechanic, & Resick, 2000). Thus, models of recovery from rape that pertain to PTSD symptoms need to account for the effects of prior trauma histories.

Summary of Models

In summary, this study tested two mediated models of the relationship between social support and PTSD (see Figure 1). In the first model, social support from one's

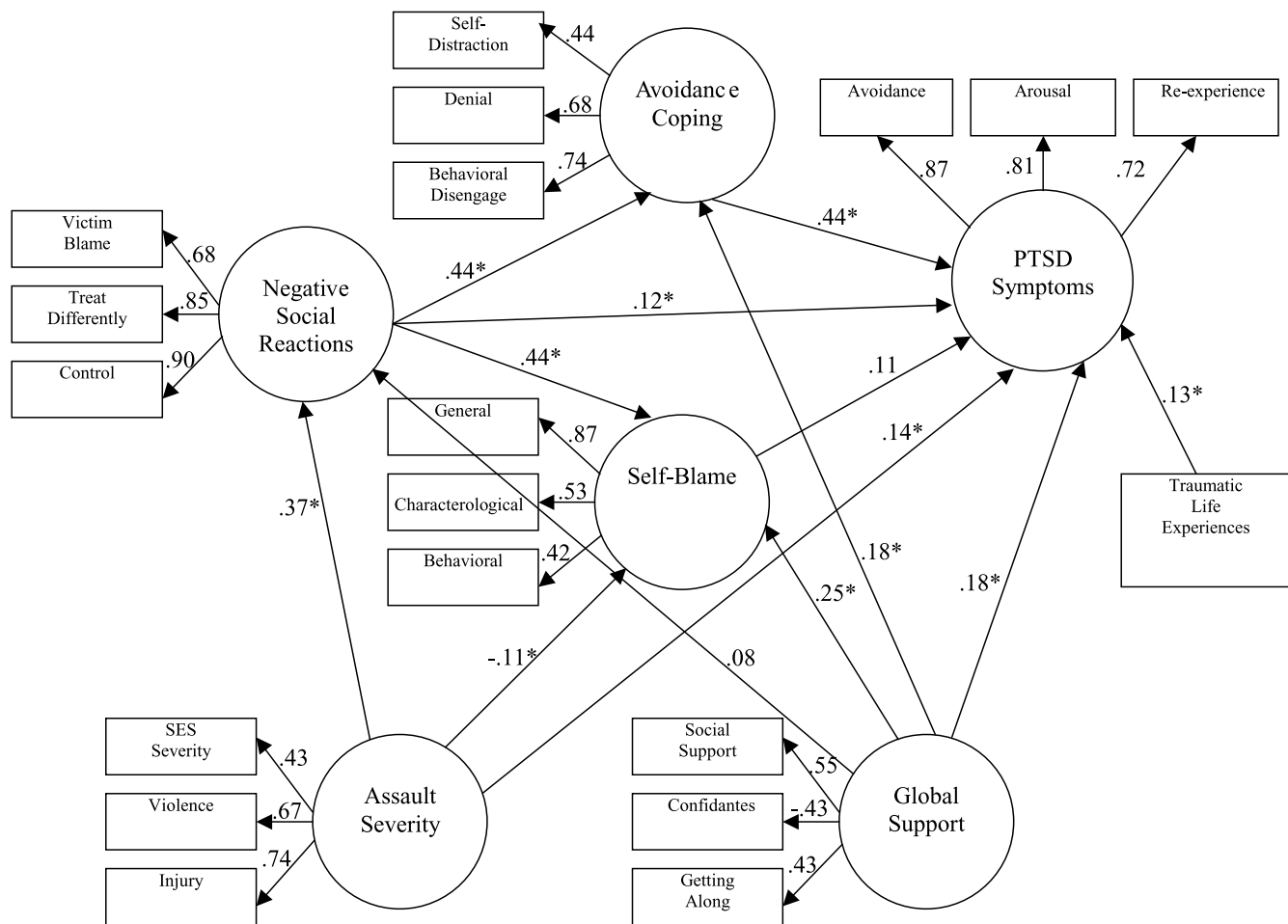


Fig. 2. Final model of relationships of social support, coping, and self-blame in relation to PTSD symptoms. This model includes correlated disturbance terms for avoidance coping and self-blame ($b = .61^*$) and correlated error terms for characterological and behavioral self-blame ($b = .43^*$) not shown in the figure. $*p < .05$.

network is treated as a control variable. The direct effects are hypothesized such that as global support decreases and as assault severity and negative social reactions increase, PTSD symptoms increase. The effect of greater negative social reactions on increased PTSD symptoms is hypothesized to be mediated by the degree of self-blame and avoidance coping. In other words, victims receiving negative social reactions will experience greater PTSD symptoms, partially due to their greater likelihood of engaging in self-blame and avoidance coping. The effect of assault severity on greater PTSD symptoms is also hypothesized to be partially mediated by both negative social reactions and self-blame. That is, more severe assault victims will have greater PTSD due to more negative social reactions and self-blame experienced by such victims. To control for other traumatic events that have been found to be related to psychological distress and PTSD (Resnick et al., 1993; Resnick, Kilpatrick, & Lipowsky, 1991), the number of lifetime traumatic life experiences participants had experienced was included in the model.

Because global support may also be directly related to negative social reactions to assault disclosure, as well as

avoidance coping and self-blame, we also tested an alternate model to determine whether poorer current support is associated with receiving more negative social reactions from others, engaging in greater avoidance coping, or blaming oneself more for the assault (see Figure 2). This alternative model posits a more central role for the overall supportiveness of one's social network in affecting assault-specific responses by victims (e.g., self-blame, coping, and support provider's negative social reactions). The models tested represent an advance in research by simultaneously considering multiple individual and contextual factors in a large diverse sample.

METHOD

Sample

The present study analyzed mail survey data about sexual assault survivors' recovery. Flyers, advertisements, and notices were distributed over a 1-year period in the Chicago metropolitan area on college campuses, in the community, and at mental health agencies and rape crisis centers. Women age 18 and older with unwanted sexual experiences

since age 14 were recruited for a 45-minute confidential mail survey. In addition to the survey, women were sent study information, a community resource list for women survivors of violence, and a postcard asking if they wished to be recontacted regarding participation in a follow-up survey and/or interview. Women were sent \$20 after returning the survey and offered a summary of results. Of those who called and requested a survey, 1,084 women returned the Wave 1 survey, a 90% response rate. For the present analyses, the sample included only women who answered affirmatively to at least one of the adult sexual victimization items and had disclosed the experience to at least one person. This resulted in a sample of 761 women, which was reduced to 636 cases when cases with missing data or outliers were removed. It should be noted that models were also run estimating missing data using the maximum likelihood method, which led to the same results and slightly better model fits, suggesting little impact of removing cases with missing data and that the models presented here are more conservative. All participants were treated in accordance with the ethical guidelines of the American Psychological Association.

Basic background information was collected in the survey. The age of the sample ranged from 18 to 71 years ($M = 32.3$ years, $SD = 10.8$ years). Assaults occurred an average of 12.67 years prior to the survey ($SD = 10.36$ years). Slightly more than half of the women self-identified as ethnic minority (58%), although the largest ethnic group consisted of White women (42%), followed by African American (40%), multiracial (8%), Latina (6%), Asian (3%), and less than 1% of American Indian women or women of other ethnic backgrounds. The majority of women identified as straight/heterosexual (75%). The majority of women (58%) were single and not living with a partner. Slightly more than one third (40%) of the sample had at least one child. The sample was well educated with 39% having a college degree or higher and 34% having some college education. Half of the sample (50%) was currently employed, although the income levels were relatively low, with 72% of the sample having household incomes of less than \$30,000.

Compared with the National Violence Against Women Survey (NVAWS; Tjaden & Thoennes, 2000), our sample of sexual assault survivors was older. NVAWS revealed that most rapes happen between the ages of 12 and 17; we were limited to studying adult women age 18 or older with a sexual assault since age 14 years. We had a higher proportion of African American women in part because we specifically recruited for ethnic minority women. We also had a higher proportion of stranger rapes (20.3%) than the NVAWS (14%). It is important to note, however, that the purpose of our study was not to assess prevalence or incidence of rape in the sampling area. Thus, comparisons of our data to other studies (especially those national in scope) should be viewed with caution. Nevertheless, this information sheds some light on how different sampling strategies

may recruit different subgroups within the population of rape survivors.

Measures

The survey asked questions about demographic background, history of trauma exposure including sexual victimization, assault-related attributions, coping, social reactions, social support, psychological functioning, and substance use. Only those measures and items that were used for the present analyses are described below. Descriptive statistics and alphas for the multi-item measures, where relevant, are presented in Table 1.

Assault characteristics. A modified version of the widely used Sexual Experiences Survey (SES; Koss, Gidycz, & Wisniewski, 1987) was used to identify completed rape and attempted rape victims, as well as women who experienced unwanted sexual contact and sexual coercion. The questions assessed adult sexual victimization from age 14 on. Women also answered each SES question with respect to whether they had each experience before age 14 to assess child sexual assault experiences. The SES has reported internal consistency reliability of .69

Table 1

Descriptive Statistics for Observed Variables

Measure	<i>M</i>	<i>SD</i>	<i>Skew</i>	<i>Kurtosis</i>	<i>Alpha</i>
Assault severity	3.33	1.23	−1.71	1.60	–
SES severity					
Offender violence	3.06	1.79	0.12	−0.98	–
Injury	1.56	1.03	0.43	0.41	–
Global support					
Confidantes	4.65	3.06	1.47	2.97	–
Getting along with others	1.94	0.66	0.65	−0.71	–
Social support	4.02	1.11	0.56	−0.14	0.70
Negative reactions					
Blame	0.76	0.92	1.31	1.17	0.80
Treat differently	0.79	0.86	1.03	0.29	0.85
Control	0.96	0.75	0.78	0.21	0.79
Self-blame					
Behavioral	3.36	1.06	−0.48	−0.50	0.83
Characterological	2.61	0.91	0.32	−0.36	0.75
General	4.57	2.05	0.29	−1.17	0.77
Avoidance coping					
Self-distraction	5.10	1.98	−0.13	−1.09	0.62
Denial	3.46	1.85	1.11	0.09	0.72
Behavioral	3.43	1.66	1.06	0.31	0.71
disengagement					
Traumatic life experiences	3.32	2.09	0.42	−0.51	–
PTSD					
Re-experiencing symptoms	4.47	3.78	0.85	0.20	0.86
Avoidance symptoms	8.32	5.77	0.25	−0.98	0.85
Arousal symptoms	6.64	4.34	0.09	−1.00	0.84

and 1-week test-retest reliability of 93% (Koss & Gidycz, 1985).

Respondents were also asked for details about their assault experiences using questions developed from past research studies (Ullman, 1996, 2000). If respondents had multiple assaults, they were asked for details about the experience they considered to be the most serious. Three aspects of the assaults were used to form the latent variable of assault severity, adapted from Wolfgang, Figlio, Tracy, and Singer's (1985) Assault Severity Index. First, participants were asked whether they experienced specific types of physical injuries as a result of the assault (ranging from mild soreness and bruises to knife/gunshot wounds). The responses were recoded to indicate the highest degree of injury each participant endorsed. Second, participants were asked to identify specific types of coercive tactics used by the perpetrator (ranging from insistence to use of a weapon) and the responses were recoded to indicate the highest degree of coercion used. Third, the degree of highest severity of sexual victimization experienced was coded according to Koss et al.'s (1987) SES guidelines into an ordinal 5-point Likert scale and ranged from less severe forms of sexual victimization such as unwanted sexual contact and sexual coercion to the more severe categories of attempted rape and completed rape.

Global social support measures. The latent variable of global support was based on three constructs measured by the Social Activities Questionnaire of the Rand Health Insurance Experiment (Donald & Ware, 1984): number of confidantes, how well one is getting along with others, and frequency of contact with social network members. Confidantes were assessed as the "number of close friends you feel you can confide in" (coded continuously as number of confidantes up to 9 confidantes and "10" for 10 or more confidantes). One question assessed subjective perception of how well they are getting along with people these days (not as well as usual, same as usual, better than usual). Frequency of social contact with network members was assessed in terms of contact in the past month. These questions consisted of five items for which respondents used one of seven ordinal responses to indicate their current frequency of contact with friends and relatives and their attendance at religious services. The mean score of these items was used as an indicator of social support. These measures have been widely used in studies assessing social network characteristics and health in large community studies, although they are not multi-item validated measures of all aspects of perceived or received social support.

Assault-specific social reactions. The latent variable of negative social reactions was constructed from three subscales of the Social Reactions Questionnaire (SRQ; Ullman, 2000), which was administered to victims who had disclosed their assaults to others. This measure was developed in prior

studies and used here because there are no other validated measures of social reactions to disclosures of sexual assault in the field. Participants were asked how often they received 48 different reactions from other persons whom they had told about the assault and responded on a scale ranging from 0 (*never*) to 4 (*always*). No time frame was specified so that respondents could report on all reactions they received since the assault. The mean number of negative social reactions (taking control of the victim's decisions, blaming the victim, treating the victim differently/stigma, distraction, egocentric responses) was computed for analyses. Three subscales were used in the present analyses: control ($\alpha = .79$), blame ($\alpha = .80$), and treating the victim differently ($\alpha = .85$). Distraction and egocentric behavior were not used due to lower reliabilities in this sample.

A recent study of the psychometric characteristics of the SRQ (Ullman, 2000) using a similar recruitment strategy showed good test-retest reliability (Pearson r ranged from .68 to .77); construct validity as shown by factor analysis (α was .93 for emotional support/belief, .86 for treat differently, .80 for distraction/discourage talking, .83 for taking control, .84 for tangible aid/information support, .80 for victim blame, and .77 for egocentric reactions); convergent validity with expected correlations of positive and negative social reactions with other social support and psychological symptom measures; and concurrent validity, assessed by correlating SRQ subscales with corresponding social reactions coded from open-ended data from questions about helpful and unhelpful responses to sexual assault disclosure.

Attributions of blame. The latent variable of self-blame was created using three measures. First, Frazier's (2003) Rape Attribution Questionnaire was used to measure attributions made by sexual assault victims in the past 30 days about why the assault occurred. In this study, the interest was in the two self-blame scales because of their significant associations with PTSD in past research. The mean rating of characterological ($\alpha = .75$) and behavioral self-blame ($\alpha = .83$) items was analyzed. Frazier (2003) obtained good inter-rater reliability data in a sample of female victims entering an emergency room after being sexually assaulted and a sample of sexual assault survivors identified by a random telephone survey. Subscale alpha coefficients ranged from .77 to .89, and test-retest reliability coefficients ranged from .68 to .80 (Frazier, 2003).

Second, the Brief Coping Orientations to Problems Experienced Scale (COPE; Carver, Scheier, & Weintraub, 1989) was used as an independent measure of general self-blame as a method of coping in the past 30 days to deal with the assault. The Brief COPE is a 28-item self-report scale that assesses a variety of coping strategies. Each 4-point Likert scale is computed as an unweighted sum of responses to the two items that make up each subscale. The COPE has adequate internal consistency reliability (all subscale alphas .60 or greater except for one) and test-retest reliability

(correlations of .46 to .86). In this study, the self-blame subscale ($\alpha = .77$) was used as an indicator of the self-blame latent variable.

Avoidance coping. The latent variable of avoidance coping was constructed from three subscales of the Brief COPE (Carver et al., 1989), with each subscale tapping into a different indicator of avoidance coping used in the past 30 days. Based on past research, three indicators were hypothesized to represent avoidance coping: self-distraction ($\alpha = .62$), denial ($\alpha = .72$), and behavioral disengagement ($\alpha = .71$; e.g., giving up any attempts at coping). Each of these 4-point Likert scales was computed as an unweighted sum of responses to two items. As noted earlier, the COPE has been widely used in studies of stressed populations and has good internal consistency reliability and test-retest reliability.

Traumatic life experiences. Lifetime histories of traumatic events were assessed with Goodman, Corcoran, Turner, Yuan, and Green's (1998) Stressful Life Events Screening Questionnaire (SLESQ), a brief self-report measure of 10 behaviorally specific screening items that assess a variety of traumatic events of an interpersonal nature. This measure was scored as the summed number of events experienced by each respondent. Respondents were also asked if they reported the same incident under more than one item. If so, it was counted as one event. Psychometric data for the SLESQ are excellent with good test-retest reliability (median Kappa = .73), adequate convergent validity with a lengthier interview (median Kappa = .64), and good discrimination between Criterion A and non-Criterion A events. Prevalence rates for specific events were similar to those reported by Norris (1992) and Kessler et al. (1995) in two large probability samples.

PTSD symptoms. The latent variable of PTSD symptoms was constructed using responses to symptom items from the Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1995). The PDS is a 17-item brief self-report instrument used to provide a diagnosis of PTSD based on the DSM-IV criteria. This scale was selected because it has been validated with sexual assault victims (Foa, Cashman, Jaycox, & Perry, 1997). Normative data on the PDS indicated good test-retest reliability ($k = .74$) for the PTSD diagnosis over an average of a 2-week interval, 87.3% agreement between diagnoses for the two administrations, and a Pearson correlation of .83 for symptom severity scores for the two administrations. The scale has good internal consistency ($\alpha = .92$) and validity with a correspondence of 79.4% between the PDS and the Structured Clinical Interview for DSM-IV Axis I disorders PTSD module (PTSD diagnoses of $k = .59$). Respondents were asked to rate how often each symptom has bothered them in the past month for the specific event. Responses were made on a 4-point scale ranging

from 0 (*not at all*) to 3 (*almost always*). In this study, the number of symptoms was calculated for each of three types of PTSD symptoms: avoidance/numbing ($\alpha = .85$), physiological arousal ($\alpha = .84$), and re-experiencing/intrusion ($\alpha = .86$). These three symptom count variables constituted the PTSD latent variable.

RESULTS

Data Preparation

For all significance tests alpha was set at .05. All measures were univariate normal with skew less than three and kurtosis less than four (Kline, 1998). The data were screened for univariate outliers by computing Z scores and looking for scores greater than or equal to 3.29 (Tabachnick & Fidell, 2001), resulting in the elimination of eight cases that contained univariate outliers. The data were also screened for multivariate outliers by computing Mahalanobi's distance, resulting in the elimination of seven cases. In addition, cases with missing data were removed, leaving 636 cases in the analyses. The data were also checked for multicollinearity across latent variables. First-order correlations are presented in Table 2. Only scales that were part of the same latent constructs showed high intercorrelations (e.g., .60 or higher); no other first-order correlations were above .60, indicating that multicollinearity is not a problem among the measured variables (Kline, 1998).

Overview of Models Tested

Analyses were conducted with structural equation modeling using Amos 4 (Arbuckle, 1999). Error terms and disturbance terms are not shown in the figures depicting the hypothesized and alternative models. Initial runs of the model included demographic variables that showed significant correlations with PTSD (e.g., education, sexual orientation), yet neither was statistically significant in the model, so demographic variables were not included in the final models presented here. No effects were found for age, race, education, or years since sexual assault in preliminary models, so those variables were not included. All models were run with and without missing data, with the same effects found for path coefficients in both cases; however, model fits were slightly higher when maximum likelihood estimation was used to estimate missing data. Therefore, we present models here without missing data, which are more conservative and have slightly worse fits. Both models presented include one set of disturbance terms that were correlated. The disturbances for avoidance coping and self-blame are correlated because they are endogenous latent variables that share variance from negative social reactions. Error terms for observed variables of characterological and behavioral self-blame were correlated because past research shows high correlations of these two types of self-blame (Frazier, 2003).

Table 2
Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Blame	—																		
2. Treat differently	.59*	—																	
3. Control	.60*	.76*	—																
4. Self-distraction	.12*	.23*	.26*	—															
5. Denial	.13*	.20*	.26*	.31*	—														
6. Behavioral disengagement	.20*	.28*	.33*	.23*	.54*	—													
7. Behavioral self-blame	.19*	.06	.11*	.10*	.06	.12*	—												
8. Character self-blame	.22*	.23*	.25*	.18*	.20*	.29*	.54*	—											
9. General self-blame	.29*	.24*	.33*	.34*	.41*	.47*	.39*	.45*	—										
10. SES severity	.18*	.19*	.20*	.13*	.09*	.11*	.15*	.19*	.15*	—									
11. Offender violence	.18	.15*	.20*	.12*	.17*	.10*	.13*	-.01	.05	.33*	—								
12. Injury	.18*	.25*	.26*	.16*	.11*	.09*	.11*	-.01	.06	.28*	.51*	—							
13. Confidantes	-.14*	.15*	.12*	.13*	.19*	.17*	.00	.18*	.16*	-.07	.13*	-.05	—						
14. Getting along with others	.10*	.11*	.11*	.01	.06	.13*	.05	.18*	.15*	.05	.04	.01	.20*	—					
15. Social support	.02	.07	-.02	.05	.03	.08*	-.02	.13*	.11*	.08*	.07	-.02	.34*	.25*	—				
16. Traumatic life experiences	.18*	.16*	.18*	.23*	.22*	.19*	.08*	.07	.16*	.22*	.36*	.24*	.13*	.09*	.10*	—			
17. Re-experiencing symptoms	.19*	.27*	.34*	.31*	.40*	.34*	.03	.24*	.33*	.14*	.20*	.21*	.16*	.07	.06	.24*	—		
18. Avoidance symptoms	.27*	.36*	.39*	.38*	.37*	.42*	.12*	.31*	.44*	.23*	.15*	.20*	.26*	.17*	.17*	.27*	.65	—	
19. Arousal symptoms	.21*	.30*	.37*	.29*	.35*	.39*	.07	.25*	.34*	.17*	.19*	.20*	.22*	.16*	.11*	.27*	.61	.73*	—

* $p < .05$.

Model 1: Initial Model

The incremental fit indices were all close to the recommendation of 0.90 or higher, indicating adequate fit (normed fit index [NFI] = 0.85, incremental fit index [IFI] = .89). The goodness of fit index (GFI) = .91, adjusted goodness of fit index (AGFI) = .87, and comparative fit index (CFI) = .88 were all acceptable. The RMSEA was 0.07, which is lower than the recommended upper limit of 0.10 (Bollen, 1989; Kline, 1998). Taken together, these findings indicate that the model has adequate to good fit. Given that the overall fit indices were adequate or good, we examined the individual paths in the model with respect to our hypotheses. Standardized regression (beta) weights and standard errors for the structural model are presented in Table 3 and the standardized regression weights are also presented in Figure 1.

All hypothesized paths except for one were statistically significant. A higher frequency of negative social reactions was associated with more self-blame, more avoidance coping, and more PTSD symptoms. Higher degrees of assault severity were associated with more negative social reactions, less self-blame, and more PTSD symptoms. More reliance on avoidance coping was associated with more PTSD symptoms. One path was contrary to the hypothesized model:

higher degrees of global support were associated with more PTSD symptoms. The relationship between self-blame and PTSD symptoms was nonsignificant. Also, in addition to significance levels of the paths, the strengths of the effects were of interest. Indirect and total effects of latent variables were calculated so that their relative strengths could be compared. The decomposition of effects can help to explain which variables have the strongest total effects on PTSD symptoms and how much of their impact is direct or indirect (e.g., through other variables in the model). Table 4 shows standardized beta weights indicating total, direct, and indirect effects of all variables in the model on PTSD symptoms. As shown in Table 4, the strongest total effects on PTSD symptoms were found for avoidance coping and negative social reactions. The effects of assault severity, traumatic life experiences, self-blame, and global support were notably weaker.

Model 2: Alternate Model

Although the initial model was adequate and observed paths supported our expectations, we also tested an alternative model in which we added several paths from global support to other constructs in the model. Victims with poorer support generally may be more likely to engage in self-blame

Table 3
Standardized Regression Estimates

<i>Path</i>	<i>Model 1</i>		<i>Model 2</i>	
	β	<i>S.E.</i>	β	<i>S.E.</i>
Negative social reactions → Avoidance coping	0.46*	0.09	0.44*	0.09
Negative social reactions → Self-blame	0.44*	0.04	0.44*	0.05
Negative social reactions → PTSD symptoms	0.12*	0.35	0.12*	0.36
Avoidance coping → PTSD symptoms	0.47*	0.32	0.44*	0.33
Self-blame → PTSD symptoms	0.11	0.70	0.11	0.75
Assault severity → Negative social reactions	0.37*	0.05	0.37*	0.05
Assault severity → Self-blame	−0.10*	0.03	−0.11*	0.03
Assault severity → PTSD symptoms	0.14*	0.30	0.14*	0.30
Global support → PTSD symptoms	0.19*	1.05	0.18*	1.05
Traumatic life experiences → PTSD symptoms	0.13*	0.08	0.13*	0.08
Global support → Negative social reactions	—	—	0.08	0.15
Global support → Avoidance coping	—	—	0.18*	0.30
Global support → Self-blame	—	—	0.25*	0.13

* $p < .05$.

Table 4
Direct and Indirect Effects of Latent Variables on PTSD Symptoms

<i>Variable</i>	<i>Model 1 (betas)</i>			<i>Model 2 (betas)</i>		
	<i>Indirect effects</i>	<i>Direct effects</i>	<i>Total effects</i>	<i>Indirect effects</i>	<i>Direct effects</i>	<i>Total effects</i>
Negative social reactions	0.26	0.12	0.38	0.24	0.12	0.36
Assault severity	0.13	0.14	0.27	0.12	0.14	0.26
Avoidance coping	0.00	0.47	0.47	0.00	0.44	0.44
Self-blame	0.00	0.11	0.11	0.00	0.11	0.11
Global support	0.00	0.19	0.19	0.14	0.18	0.32
Traumatic life experiences	0.00	0.13	0.13	0.00	0.13	0.13

and to engage in avoidance coping (Silver, Wortman, & Crofton, 1990). It is also possible that lower global support may be related to receiving more negative social reactions when disclosing assault. Because the extent of one's current global support may also be associated with one's self-blame, avoidance coping, and receipt of negative social reactions in response to talking about sexual assault, these three paths were added in Model 2 (see Figure 2). Incremental fit indices were similar or slightly higher and all were close to or above the recommendation of 0.90 or higher, indicating good fit (NFI = 0.86, IFI = .89). The GFI = .91, AGFI = .88, CFI = .89, and root mean square error of approximation = 0.07 were all acceptable and indicated that the alternate model had a slightly better fit. The Akaike's Information Criterion (AIC) compares nested models and showed that this alternate model had better fit (AIC = 665) than the initial model (AIC = 678), mainly due to the greater effect of global support revealed by this model. Standardized regression (beta) weights and standard errors for the structural model are presented in Table 3 and the standardized regression weights are also presented in Figure 2.

As before, all hypothesized paths except for one were statistically significant and almost identical to the first model. A higher frequency of negative social reactions was associated with more self-blame, more avoidance coping, and more PTSD symptoms. Higher degrees of assault severity were associated with more negative social reactions, less self-blame, and more PTSD symptoms. More reliance on avoidance coping was associated with more PTSD symptoms. As in Model 1, higher degrees of global support were associated with more PTSD symptoms. The relationship between self-blame and PTSD symptoms was nonsignificant. The three new added paths showed that global support was unrelated to negative social reactions, but was significantly related to more avoidance coping and more self-blame.

As shown in Table 4, the strongest total effects on PTSD symptoms were found for avoidance coping, negative social reactions, and, unlike the first model, for current global support, which was weaker in Model 1. The effects of assault severity, traumatic life experiences, and self-blame were notably weaker as in the first model.

DISCUSSION

Sexual assault experiences affect women's symptoms of PTSD through a variety of pathways. The present study extended past research on the relationship of sexual assault and PTSD symptoms by testing two models that included factors related to individual trauma history, assault characteristics, self-blame, avoidance coping, general social support, and assault-specific social reactions. Although past studies have examined some of the constructs in this model (Frazier, 2003; Koss et al., 2002; Ullman, 1996; Ullman & Filipas, 2001), no past study has integrated all of the factors studied into one model and tested the paths simultaneously using standardized measures of latent constructs in a large, diverse sample of sexual assault victims. The results indicated some support for two possible models and consistent support for associations found in prior research. These models are conservative tests of these relationships in that we sampled victims who varied in time since their assaults, as well as demographic backgrounds, controlling for their histories of other traumatic events, which are typically a strong correlate of PTSD symptoms (Kessler et al., 1995; Resnick et al., 1993; Resnick et al., 1991). Our model fits were adequate to good, suggesting preliminary support for such models. The major difference between the two models was that, contrary to Model 1, in which only a direct path between global support and PTSD was hypothesized, in Model 2, global support was related to greater avoidance coping and self-blame, but not to negative social reactions after these paths were added. It is not surprising that current support did not affect assault-specific negative social reactions because we asked about negative social reactions received since the assaults, many of which occurred years ago. It is possible that survivors engaging in more current self-blame or avoidance coping may withdraw from others and seek less support, which could explain these effects. Alternatively, victims with poorer support networks in general may be more likely to rely on avoidance coping and blame themselves following sexual assault. Adding the links of global support to avoidance coping and self-blame showed that global support may play an important role in understanding survivors' responses to assault. Longitudinal data are needed to clarify the direction of social support variables with other constructs in the model, as conflicting findings are common in social support studies using cross-sectional data (Dooley, 1985). However, the findings clearly show that researchers should control for both general measures of support as well as assault-specific reactions to disclosure in studies of recovery from sexual assault.

The alternate model as a whole demonstrated good fit; the most notable finding was the strength of effects of avoidance coping and negative social reactions in contrast to the other variables. It appears that these two constructs play a pivotal role as correlates of PTSD symptoms. Consistent with Ullman's (1996) study, avoidance coping partly mediated the effect of negative social reactions on symptoms.

It is possible that negative reactions not only lead to more avoidance coping but that such coping may elicit more negative reactions in subsequent disclosures. There is evidence in other studies that victims are blamed not only for the assault but also for coping poorly (Silver et al., 1990; Winkel & Koppelaar, 1991). Longitudinal analyses may help to clarify whether there is a bidirectional relationship between coping and social reactions that leads to increased PTSD symptoms.

As predicted, higher degrees of assault severity were associated with more negative social reactions and less self-blame. These findings are consistent with prior research (Ullman, 2000; Ullman & Siegel, 1995). These results suggest that people respond more negatively to victims who experience more violent assaults or perhaps that survivors of more severe assaults tell more people, increasing the likelihood that they will receive negative reactions. Bivariate correlations did show that severe assaults are related to telling more formal support sources ($r = .13, p < .01$), but not more informal sources ($r = .03, ns$). In addition, telling more to both types of support sources is related to receiving more negative social reactions ($r = .24, p < .01$ for number of informal sources; $r = .35, p < .01$ for number of formal sources). This pattern of relationships suggests that the severe-assault victims may be getting more negative social reactions overall due to their greater likelihood of disclosing to support sources compared with victims of less severe assaults. These negative reactions then contribute to survivors' symptoms. However, victims do not blame themselves as much after violent assaults, possibly because they are more likely to label their assaults as rapes (Fisher et al., 2003) because the assaults conform to societal stereotypes of what defines real rape (Estrich, 1987).

Consistent with Ullman (1996), self-blame did not mediate the effect of negative social reactions on symptoms, even though negative social reactions were related to self-blame and bivariate analyses showed positive relationships between self-blame and PTSD symptoms. Prior research showing a positive relationship between victims' self-blame and PTSD (e.g., Frazier, 2003) may have led to mistakenly attributing symptoms solely to self-blame, which may be at least partially due to negative social reactions. Although self-blame was correlated with greater symptoms at the bivariate level, when social reactions were accounted for in our structural equation model, victims' self-blame no longer contributed significantly to PTSD symptoms. This is an important finding that needs to be replicated. It implies that negative social reactions of support providers may be more important targets for intervention efforts than self-blame attributions of victims. One path was contrary to the hypothesized model: higher degrees of global support were associated with more PTSD symptoms, not fewer symptoms as predicted. However, other researchers have found similar results when symptoms and support are measured at the same time in cross-sectional studies (Dooley, 1985), which may be the result of symptomatic people seeking

more support. Longitudinal analyses are needed to clarify this relationship.

This study had a number of strengths as well as several limitations. Unlike past studies that have examined the effects of social reactions to victims, this study had a much larger, more ethnically and socioeconomically diverse sample and used standardized measures of important psychosocial factors, including coping strategies and attributions of blame. This methodology allowed us to test a model with adequate statistical power and to examine the interrelations of social reactions, social cognitive mediators (e.g., coping, self-blame), and psychological symptoms. However, there were limitations surrounding the sample, time frames for some measures, and general limitations of structural equation modeling. Although the sample size was suitably large for the demands of structural equation modeling, it was limited by its cross-sectional design and nonrepresentative sample. This limits the ability to generalize the findings to representatively sampled survivors. We recruited participants using several methods to obtain a convenience sample. Because most women responded to advertisements about the study, we could not analyze the effect of specific recruitment sources on results of the study. It is unknown if the relationships found here would be replicated in representatively sampled victims, which should be studied in future research. Because race was not related to other variables in our model in preliminary analyses, we did not test our models separately by race; however, research on recovery from rape within ethnic minority groups is needed to better understand all women's sexual assault experiences. We are currently examining age and socioeconomic status differences within a subsample of African American women from this study (Long & Ullman, 2005).

Because these data were derived from a longitudinal study, most constructs were assessed with a time frame of the past 30 days. This time frame was used to assess changes in attributions, coping, and symptoms and may not capture the range of attributions made and distress women experienced since the assault. This concern is particularly relevant because most of the assaults described were not recent (years since assault: $M = 12.67$, $SD = 10.36$). Memory biases are also possible as with all retrospective research. Although most measures used a past-30-days time frame, because assault disclosure and social reactions can occur any time following assault, social reactions were assessed with a time frame of "since the assault" to capture all reactions survivors may have received upon disclosure to others. Finally, like all structural equation modeling, these analyses are limited by the fact that a model with good fit does not mean that the model is proven (Bollen, 1989; Kline, 1998; Tabachnick & Fidell, 2001). Therefore, to assert that this model fits for the population of assault survivors, it must be tested with other samples and particularly with data from a representative sample.

Despite these limitations, the findings of this study suggest directions for future research in several areas. In ad-

dition to the possibilities of testing the model on a representative sample, the findings reinforce the need for more consistent consideration of social context variables in studies of the mental health impacts of sexual assault. Too often studies on the psychological impact of sexual assault have focused predominantly on individual variables, even though some researchers have asserted that we need ecological models to understand sexual assault trauma (Campbell et al., 2001; Neville & Heppner, 1999; Wasco, 2003). These findings support the importance of social reactions as they impact individual behaviors such as avoidance coping, self-blame attributions, and the PTSD symptoms resulting from sexual assault. Additionally, testing the hypothesized model with longitudinal data may help to clarify the direction of effects.

The findings also have implications for postassault interventions. Although there is merit to the long-standing clinical emphasis on decreasing self-blame, these findings support the idea that self-blame may in part be the result of social reactions the survivor receives when she discloses the assault. To the degree that negative social reactions cause or reinforce self-blaming cognitions and perpetuate survivors' use of avoidance coping strategies, rape crisis and mental health personnel should actively work with survivors to assess and develop protective buffers against negative social reactions. Interventions focused on reducing reliance on avoidance coping strategies (e.g., substance abuse, blocking out the assault from memory) may also be more helpful than those focused on changing attributions of blame for why the assault occurred, given that coping appears to have stronger effects on PTSD symptoms (see also Frazier et al., 2005; Valentiner et al., 1996). Furthermore, given the importance of social support in protecting against PTSD in crime victims (Yapp & Devilly, 2004) and trauma survivors generally (Brewin et al., 2000), interventions to improve the size and quality of survivors' current support networks and/or involve them in support groups may be helpful for reducing self-blame and avoidance coping. The notion that disclosure is therapeutic for mental health (Pennebaker, Kiecolt-Glaser, & Glaser, 1988) may need to be qualified by the reactions of others to survivors, especially in light of other recent experimental data showing that the benefits of talking about traumas are diluted when talking to an unsupportive or invalidating confederate (Lepore, Ragan, & Jones, 2000). Finally, the role of negative social reactions underscores the continued need for community education on how to respond to survivors of sexual assault. Focusing exclusively on individual victims will not change the social context that they face when disclosing an assault. Focused interventions with formal support providers and public awareness campaigns may help to change professional responses and community norms to enhance women's recovery from sexual assault.

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