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Evaluation of an information processing model following sexual assault

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Abstract

There is growing recognition that individuals vary in their response to traumatic experiences. Resick and Schnicke (1992) developed an information processing model of trauma response patterns, theorizing that individuals vary in how they integrate the experience into their schematic beliefs. Specifically, individuals can respond to trauma by assimilation, altering the trauma to fit with extant schemas; accommodation, altering extant schemas; or over-accommodation, engaging in maladaptive schema change. Littleton (2007) supported that these response patterns are reflected in distinct coping patterns among rape victims. The current study utilized latent profile analysis (LPA) to replicate Littleton's (2007) findings in a sample of 340 college rape victims, as well as evaluated the extent to which these response patterns were related to distress, trauma-related schemas, re-victimization risk behaviors, and re-victimization. Results of the LPA supported the existence of the three response patterns. In addition, victims classified into the three response patterns differed in their distress, adherence to trauma-related schemas, and re-victimization risk behaviors. While no significant differences in re-victimization rates were found, re-victimization was common. Implications of the findings for future research and intervention are discussed.

Keywords

adjustment; information processing; re-victimization; sexual assault

Sexual assault among women, generally defined as unwanted sexual activity obtained by threat, force, or against an individual incapable of consenting (e.g., due to substance use), is clearly a major public health problem, affecting an estimated 15 to 20% of women (Cloutier, Martin, & Poole, 2002; Elliott, Mok, & Briere, 2004; Littleton, Radecki Breitkopf, & Berenson, 2008; Masho, Odor, & Adera, 2005). However, there is growing recognition that victims of this crime differ in their response to, and adjustment following, this experience. This notion is supported in the broader trauma literature where a number of potential posttrauma adjustment patterns have been identified (e.g., Bonanno et al., 2008). Thus, there is a need to delineate the nature of these adjustment patterns among sexual assault victims to more fully understand sexual assault recovery and to develop effective, targeted interventions.

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Resick and Schnicke (1992), drawing on earlier work by Hollon and Garber (1988) as well as research on schematic beliefs and trauma such as that of Janoff-Bulman and McCann and Pearlman (1990), developed an information processing model of individuals' responses to experiences of interpersonal violence. They posited that the experience of interpersonal violence represents a severe threat to schematic beliefs commonly held by individuals, such as believing that the world is generally a good place and people are generally good (benevolence beliefs), that others can usually be trusted, and that the self has worth (self-worth beliefs; Janoff-Bulman, 1989). They further suggested that individuals can resolve the challenge to these schemas presented by the experience of interpersonal violence in three ways. The first way is by assimilating the experience into existing schematic beliefs through minimizing the severity of the trauma, such as by conceptualizing it as a more benign experience (e.g., labeling a sexual assault as a miscommunication), and by minimizing the extent to which they perceive the trauma as having a negative impact on them. Alternatively, victims of interpersonal violence can engage in accommodation, altering their extant schemas to accommodate the traumatic experience (e.g., believing that many individuals can be trusted but a number cannot). However, some victims engage in the third strategy, over-accommodation, characterized by maladaptive or extreme schema changes (e.g., "The world is a very dangerous place", "I am worthless", "No one can be trusted").

This model represents an advance over prior schema models in a number of ways. First, it delineates multiple potential responses to the schematic threat presented by traumatic events. In addition, victims' specific schematic response pattern has clear implications for their post-assault adjustment and behaviors. The model also explains why individuals differ in their response to the schematic threat of traumas. For example, a woman who has experienced multiple traumas may be particularly likely to engage in over-accommodation due to difficulties with maintaining positive beliefs about the world in the face of the schematic threat of multiple traumas. Finally, this model has led to the development of a highly effective treatment for PTSD, cognitive processing therapy (Cason, Resick, & Weaver, 2002).

Littleton (2007) theorized that these information processing patterns would be reflected in the coping strategies that victims of interpersonal violence utilize to manage their experience. Specifically, she hypothesized that over-accommodated victims would primarily rely on maladaptive avoidance coping strategies, such as attempting to suppress their thoughts and feelings about the trauma or engaging in wishful thinking, because trauma-related thoughts and feelings are associated with activation of highly distressing negative schemas about themselves and the world. In contrast, it was suggested that assimilated victims would engage in less coping overall as they would likely appraise their experience as a less distressing event, and thus feel less need to engage in extensive coping efforts (Snyder & Pulvers, 2001). Finally, victims who successfully engaged in accommodation or were in the process of accommodating their experience were proposed to utilize a variety of coping strategies including adaptive approach strategies (e.g., seeking support and expressing their emotions), as they attempted to reconcile the experience with their extant beliefs.

Littleton (2007) first evaluated this possibility in a sample of 256 college women who had experienced sexual assault as an adolescent or adult. *K*-means cluster analysis was used to evaluate victims' sexual assault coping patterns; 25% of victims were classified as assimilated (lower scores on all coping scales), 33% of victims as accommodated (moderate to high scores on all coping scales), and 42% of victims as over-accommodated (high scores on the avoidance coping scales). Supporting the validity of victims' classification into these three response patterns, over-accommodated victims reported greater distress and PTSD symptoms than individuals classified into the other two victim groups. Over-accommodated

victims reported lower self-worth than individuals classified into the other two victim groups as well. Finally, assimilated victims were less likely than individuals classified into the other two victim groups to conceptualize their experience as a victimization (i.e., to acknowledge the rape). In contrast, there were few differences in the assault characteristics of victims classified into these three victim groups, suggesting that these findings were not an artifact of differences in the circumstances of the assaults experienced by these victims.

While Littleton's (2007) results provide initial support for the existence of the three response patterns proposed by Resick and Schnicke (1992) among rape victims and the validity of utilizing victims' coping patterns as a way to classify victims into these response patterns, the study also had a number of limitations. First, and foremost, *k*-means cluster analysis is limited in the extent to which rigorous methods can be applied to compare alternative models (Vermunt & Magidson, 2002). In addition, few hypothesized differences were found between assimilated and accommodated victims (for example, one would expect that accommodated victims would report greater disruptions in their trauma-relevant schemas than assimilated victims). It is unclear if the lack of differences found between these two groups reflects problems with the classification of victims in the study, a problem with the theorized model, or a lack of power to detect differences among the groups. Finally, Littleton (2007) hypothesized that there may be long-term negative consequences to engaging in assimilation, particularly with regard to re-victimization risk because these victims may not change behaviors that potentially place them at risk for re-victimization (e.g., drinking heavily, associating with the assailant) and may be less able to recognize potentially risky situations. However, the study included limited evaluation of re-victimization risk behaviors and did not assess re-victimization, thus this possibility could not be evaluated.

Thus, the current study sought to validate Littleton's (2007) approach to classifying victims into Resick and Schnicke's (1992) theorized information processing model of interpersonal violence response in a large sample of college rape victims using latent profile analysis (LPA). LPA was chosen over other analysis strategies (e.g., *k*-means cluster analysis) because it enables one to directly compare the fit of multiple models (Vermunt & Magidson, 2002). The study also evaluated differences among victims classified into the three response patterns with regard to their assault characteristics, distress, and trauma-related schematic beliefs. In addition, the study evaluated differences among victims classified into the three response patterns with regard to two empirically supported re-victimization risk behaviors (hazardous drinking and use of sex to reduce negative affect; Messman-Moore & Long, 2002; Orcutt, Cooper, & Garcia, 2005; Van Bruggen, Runtz, & Kadlec, 2006). Finally, differences in re-victimization over the course of six months among victims classified into the three response patterns were evaluated.

Method

Participants

A total of 1,744 women, recruited from the psychology department participant pools of three large southeastern universities, participated in the study for course credit during two academic semesters (Fall 2006 and Spring 2007). A total of 353 women, 20.2% of the sample, responded positively to a screening questionnaire assessing sexual assault experiences in adolescence or adulthood. Of these women, 13 (3.7%) changed their responses to the sexual assault screening items and had extensive missing data and were eliminated from analyses, leaving a final sample of 340 women. Participants were 21.6 years old on average ($SD = 5.6$, range 18–54 years). A total of 74.4% self identified as European American, 8.5% as Latina, 6.4% as African American, and 5.8% as Asian American. The

remaining women (4.7%) self-identified as Native American, multi-ethnic, other, or did not indicate their ethnicity.

Procedures

Data were collected using an online survey. Potential participants were recruited using fliers and announcements on psychology department research participant management websites at three universities. Posted information stated that participants would be asked to complete a confidential survey about their negative sexual experiences, coping, and psychological health. Participants were excluded if they were male or under 18 years of age. Student identification information was collected to award course credit and to prevent duplicate participation (this information was removed from the data file prior to downloading).

Participants were given a brief description of the study and information about available counseling resources and asked to provide their electronic consent. Behaviorally specific questions were used to determine if participants had an experience of sexual abuse in childhood (before age 14). Behaviorally specific screening questions were also used to determine if participants had an experience in adolescence or adulthood that would meet a legal definition of rape or sexual assault. Participants who endorsed having had a sexual assault experience in adolescence or adulthood were asked several questions about the circumstances of their “experience with unwanted sex” after they turned 14 (or the one they regarded as the most serious if they had experienced multiple victimizations). Victims also completed several measures related to their post-assault experiences, including how they coped with the experience and symptoms of PTSD in connection to the unwanted sexual experience. All screened participants completed measures of their current depression, hazardous alcohol use, and use of sexual activity to reduce negative affect.

Women who endorsed having experienced unwanted sex were given the option of providing up to two email addresses to be contacted to complete a follow-up survey in six months. These women were sent up to four email reminders, sent weekly, to complete this follow-up survey. The follow-up survey assessed sexual victimization experiences that had occurred in the past six months. Participants received a \$20 gift certificate for completing the follow-up survey. The study was approved by the institutional review boards of the three universities and followed the guidelines for ensuring the confidentiality of online data outlined by Reips (2002).

Measures

Sexual abuse items—Three behaviorally specific items were administered to assess experiences of sexual abuse in childhood. These items were drawn from a measure developed by Williams, Siegel, and Pomeroy (2000) and assessed experiences of sexual contact before the age of 14 with relatives (e.g., parents, grandparents, stepparents, siblings, aunts, uncles) and with individuals in caretaking roles or positions of authority (e.g., teachers, ministers, babysitters). The items also assessed experiences of any unwanted sexual contact that occurred before the participant turned 14.

Sexual assault items—Two behaviorally specific screening items from the Sexual Experiences Survey (SES; Koss & Gidycz, 1985) were administered in the initial survey to assess experiences of rape or sexual assault since the age of 14. The items assessed experiences of unwanted sex with a man or men (vaginal, oral, anal intercourse, or object penetration) obtained by force, threat of force, or that occurred when the individual was incapacitated or unconscious, such as from alcohol or drugs.

At the six month follow-up assessment, participants completed the same screening items regarding experiences of rape or sexual assault that occurred in the past six months. Two additional behaviorally specific screening items from the Sexual Experiences Survey (Koss & Gidycz, 1985) were also administered to assess experiences of *attempted* rape over the past six months. These items assessed instances of attempted sexual assault that occurred following force, threat of force, or when the individual was incapacitated or unconscious, such as from alcohol or drugs.

Assault characteristics questionnaire—Participants completed a questionnaire regarding the circumstances of their sexual assault experience. This questionnaire was based on one developed by Littleton and colleagues (Littleton, Axsom, Radecki Breitkopf, & Berenson, 2006). Like prior studies using this measure, three variables were constructed regarding the types of force participants reported that the assailant used from a list provided: verbal threats, moderate physical force (using his superior body weight, twisting your arm or holding you down), and severe physical force (hitting or slapping you, choking or beating you, showing or using a weapon). Three resistance variables were similarly constructed regarding the types of resistance strategies participants reported using from a list provided: non-verbal resistance (turned cold, cried), verbal resistance (reasoned or pleaded with him, screamed for help), and physical resistance (ran away, physically struggled).

Participants were asked to indicate their relationship with the assailant at the time of the experience of unwanted sex from a list provided. Like prior studies using this measure (Littleton et al., 2006; Littleton et al., 2008), their relationship with the assailant was coded as romantic (dating casually, steady date, romantic partner) or non-romantic (stranger, just met, acquaintance, friend, relative). In addition, participants estimated the number of standard drinks both she and the assailant had consumed prior to the assault, coded as binge drinking or non-binge drinking (four standard drinks or more by the participant, five standard drinks or more by the assailant; National Institute on Alcohol Abuse and Alcoholism, 2006). Participants were also asked to indicate what label they thought best described their assault experience from a list provided. Participants who described the experience as a victimization (i.e., rape, attempted rape, some type of crime) were classified as acknowledged, and those who gave the experience a more benign label (i.e., miscommunication, bad sex, hook-up, seduction, not sure) were classified as unacknowledged. Participants were asked to estimate how many months ago the assault had occurred (coded as one year ago or less, one to two years ago, and more than two years ago). Finally, participants indicated if they continued their relationship with the assailant after their experience of unwanted sex.

PTSD Symptom Scale—The PTSD Symptom Scale (PSS; Foa, Riggs, Dancu, & Rothbaum, 1993) was administered to assess symptoms of PTSD in connection to individuals' sexual assault experience. The PSS is a 17-item measure with items mapping on to PTSD diagnostic criteria. For each item, individuals rated how often they had the described symptom *in the past week* in relation to their experience of unwanted sex on a 4-point Likert scale anchored by 0 (*not at all or only one time*) and 3 (*five or more times per week/almost always*). A sample item is, "Trying not to think about, talk about, or have feelings about the event." Scores can range from 0 to 51 and a cut-off of 14 or above on this measure indicates clinically significant PTSD symptomatology (Coffey, Gudmundsdottir, Beck, Palyo, & Miller, 2006). Cronbach's alpha for the scale in a sample of rape victims was .93, and in the current study was .90. The PSS was found to have a sensitivity of 62% and specificity of 100% for a diagnosis of PTSD when compared with a structured clinical interview (Foa et al., 1993).

Center for Epidemiologic Studies Depression Scale—The Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) was administered to assess depressive symptoms. This 20-item self-report measure assesses primarily the affective component of depression. For each item, individuals indicated how often they have felt that way in the past week on a 4-point Likert scale bounded by 0 (*rarely or none of the time/less than one day*) and 3 (*most or all of the time/5–7 days*). A sample item is, “I felt sad.” Scores can range from 0 to 80 and scores of 23 or above indicate probable depression (Myers & Weissman, 1980). Cronbach’s alpha for the measure in community and patient samples have ranged from .84 to .90 and the four-week test-retest reliability was found to be .67 (Radloff, 1977). In the current study, Cronbach’s alpha for the measure was .89. Supporting the validity of the measure, scores have been found to correlate moderately to strongly with other clinician-administered and self-report measures of depression and to be sensitive to changes in depressive symptomatology following treatment (Weissman, Sholomskas, Pottenger, Prusoff, & Locke, 1977).

Posttraumatic Cognitions Inventory—The Posttraumatic Cognitions Inventory (PTCI; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999) was administered to assess participants’ adherence to schematic beliefs commonly disrupted by traumatic experiences. The measure assesses three types of negative posttraumatic schemas: negative cognitions about the world (The world is a dangerous place), negative cognitions about the self (I am inadequate), and self-blame for the trauma (The event happened to me because of the sort of person that I am). For each item, individuals indicated how much they agreed or disagreed with the statement on a 7-point Likert scale bounded by 1 (*totally disagree*) and 7 (*totally agree*). Cronbach’s alpha for the scales in a community-recruited sample ranged from .86 to .97 and three-week test-retest reliabilities ranged from .81 to .86 (Foa et al., 1999). In the current sample, Cronbach’s alpha for the scales ranged from .81 to .95. Supporting the validity of the measure, in prior studies, scores correlated moderately to highly with similar scales on other extant inventories assessing trauma-related worldview (Foa et al., 1999). In addition, prior research supported that scores successfully discriminated among individuals without a trauma history, those with a trauma history without current PTSD, and those with a trauma history and current PTSD (Foa et al., 1999).

Coping Strategies Inventory—The 32-item, short form of the Coping Strategies Inventory (CSI; Tobin, Holroyd, Reynolds, & Wigal, 1989) was administered to assess victims’ strategies in coping with the assault. This measure has four subscales, two assessing adaptive approach coping (termed engagement scales) and two assessing maladaptive avoidance coping (termed disengagement scales). The subscales of the measure are: problem engagement (problem solving and cognitive restructuring), emotion engagement (social support seeking and emotional expression), problem disengagement (problem avoidance and wishful thinking), and emotion disengagement (social withdrawal and self-criticism). Sample items for each scale are as follows: problem engagement (I worked on solving the problems in the situation), emotion engagement (I talked to someone about how I was feeling), problem disengagement (I hoped a miracle would happen), and emotion disengagement (I spent more time alone). For each item, individuals rated how often they used the strategy in coping with their experience of unwanted sex on a 5-point Likert scale anchored by 1 (*not at all*) and 5 (*very much*). Cronbach’s alpha of these scales have been found to average .80 (Tobin, 2001), and in the current study ranged from .73 to .89.

Alcohol Use Disorders Identification Test—The five-item version of the Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001; Miles, Winstock, & Strang, 2001) was administered to assess hazardous alcohol use. A score of 5 or above on this measure indicates hazardous use (Miles et al., 2001). A sample item is,

“How often during the past year have you failed to do what was expected of you because of drinking?” In the current study, Cronbach’s alpha of this measure was .77. The AUDIT was found to have a sensitivity of 79% and a specificity of 95% for alcohol dependence and harmful use as compared to a structured clinical interview (Piccinelli et al., 1997). It should be noted that 6.9% ($n = 23$) of the women reported no past year alcohol use and did not complete this measure.

Use of Sex to Reduce Negative Affect—This four-item measure is designed to assess use of sexual activity to reduce negative affect (Orcutt et al., 2005). In the current study, participants were first asked whether they had engaged in sexual activity over the past year, including kissing and petting and to estimate the number of partners they had in the past year. Participants who reported engaging in sexual behavior were then asked to indicate how often they had engaged in sexual activity, including kissing and petting, for the listed reasons on a 5-point Likert scale anchored by 1 (*almost never/never*) and 5 (*almost always/always*). Scores can range from 4 to 20. A sample item is, “To cope with upset feelings.” Cronbach’s alpha among a community recruited sample was .81, and in the current study was .92. It should be noted that 2.1% ($n = 7$) of participants did not report engaging in any sexual activity in the past year and did not complete this measure.

Analysis Plan

Latent profile analysis (LPA) was conducted using the Mplus program (version 5.1; Muthén & Muthén 1998–2007). LPA utilizes a set of observed continuous variables as measures of a single underlying latent category and seeks to sort individuals into similar groups based on their standing on that latent variable. LPA assumes that individuals in the sample were drawn from multiple subpopulations. Participants’ scores on the four coping subscales of the CSI (problem engagement, emotion engagement, problem disengagement, emotion disengagement) were utilized in the LPA. One class, two class, three class, and four class models were evaluated.

Several fit indices were utilized to compare the relative fit of the models because likelihood ratio tests comparing nested models utilized in traditional structural equation modeling cannot be used in LPA. Instead, for each model, three statistics were calculated and compared. Specifically, the Bayesian information criteria (BIC; Schwarz, 1978) value for each model was compared, with lower relative BIC values suggesting better model fit. BIC was chosen over other information criterion statistics because a recent Monte Carlo simulation study suggested that the BIC was the best performing information criterion statistic for evaluating LPA solutions (Nylund, Asparouhov, & Muthén, 2007). The Lo-Mendell-Rubin Likelihood Ratio Test (L-M-R LRT) was also calculated for each model. This statistic compares the fit of the current model to a model with one fewer class, with a statistically significant L-M-R LRT suggesting that the current model provides a significant improvement in model fit over the reduced model (Nylund et al., 2007). Finally, entropy values were calculated, which evaluate the accuracy of the model at classifying individuals into their classes, with values closer to 1.0 suggesting better fit (Aldridge & Roesch, 2008).

After determining the best fitting model, participants were placed into their most likely class membership based on the results of the LPA. ANOVAs with follow-up Bonferroni adjusted pairwise comparison were then conducted comparing participants across classes with regard to their depressive symptoms (CESD), PTSD symptoms (PSS), alcohol use (AUDIT), use of sex to regulate negative affect, and trauma-related cognitions (PTCI). Pearson chi square analyses with follow-up Bonferroni adjusted pairwise comparisons were also conducted comparing participants across classes on assault characteristics (e.g., force used in the assault, resistance by the victim, binge drinking by the victim and assailant) and other

dichotomous variables (e.g., acknowledgment status, history of childhood sexual abuse). Finally, Pearson chi square analyses with follow-up pairwise comparisons were conducted comparing rates of re-victimization at follow-up among participants across classes.

Results

Descriptive Statistics

Examining the characteristics of the assaults experienced by participants, the majority reported that the assailant used some type of violent tactic, with 16% reporting he used verbal threats, 64% that he used moderate physical force, and 6% that he used severe force. Most victims resisted in some way, with 59% reporting using nonverbal resistance, 40% using verbal resistance, and 40% using physical resistance. Binge drinking prior to the assault was also common, with 49% of victims reporting they had engaged in binge drinking and 44% reporting the assailant engaged in binge drinking. The assaults were fairly recent with 33% having occurred within the past year and an additional 15% having occurred between one and two years ago. A sizable percentage of victims reported elevated distress, with 32% scoring above the clinical cut-off on the PTSD Symptom Scale and 32% scoring above the cut-off for probable depression on the CES-D. Finally, 49% of participants scored above the cut-off for hazardous drinking on the AUDIT.

Latent Profile Analysis

Solutions for the LPA models are summarized in Table 1. Fit indices supported that the three and four class models demonstrated the best fit to the data overall. While the four class model had a slightly lower BIC value and a higher entropy value than the three class model, the L-M-R LRT for the four class model was not significant. In addition, the four class model included one class with only eight individuals (2% of the total sample). Given the non-significant L-M-R LRT test for the four class model and the fact that it included one class with only 2% of participants, the three class model was retained as the best overall fit to the data. Mean scores on the coping subscales among participants in the three classes are summarized in Table 2. A total of 21% of participants were classified as assimilated and had relatively low scores on all coping scales with their highest score on the problem disengagement scale. A total of 34% of participants were classified as accommodated/accommodating and had relatively high scores on all coping scales with their highest score on the emotion engagement scale. Finally, 45% were classified as over-accommodated and had higher scores on the disengagement coping scales and lower scores on the engagement coping scales.

Examining differences in coping usage among victims, the groups differed significantly in their use of avoidance coping strategies (emotional avoidance, $F(2, 337) = 143.5, p < .005$, problem avoidance, $F(2, 337) = 136.1, p < .005$) with follow-up pairwise comparisons supporting that all three groups differed significantly. There were also significant differences among groups in their use of approach coping strategies (emotional approach, $F(2, 337) = 285.8, p < .005$, problem approach, $F(2, 337) = 48.4, p < .005$) with follow-up pairwise comparisons supporting that accommodated/accommodating victims differed from the other two groups in their use of these strategies.

Comparisons of Participants Classified into the Three Response Clusters

Examining the characteristics of the assaults of participants in each response cluster revealed only a few significant differences (see Table 3). Specifically, there were significant differences in the percentage of participants in each cluster reporting the assailant used moderate physical force, $\chi^2(2) = 12.1, p < .005$, with follow-up pairwise comparisons revealing that assimilated and over-accommodated victims differed significantly. There

were also significant differences in the percentage of participants reporting they engaged in non-verbal resistance, $\chi^2(2) = 6.9, p < .05$, with follow-up pairwise comparisons revealing that assimilated and over-accommodated victims differed significantly. In addition, there were significant differences in the percentage of participants who were unacknowledged rape victims, $\chi^2(2) = 10.9, p < .005$, with follow-up pairwise comparisons revealing that assimilated victims differed significantly from the other two groups. Finally, there were significant differences among groups in the percentage of participants reporting a childhood sexual abuse history, $\chi^2(2) = 7.5, p < .05$, with follow-up pairwise comparisons revealing that over-accommodated victims were significantly more likely than accommodated victims to report such a history. There were no other significant differences among the victim groups in assault characteristics.

The scores of participants in each response cluster on the distress, posttrauma cognitions, alcohol use, and sex to reduce negative affect measures are summarized in Table 4. There were significant differences among the groups in depression scores, $F(2, 336) = 25.2, p < .005$, with follow-up pairwise comparisons supporting that assimilated and over-accommodated victims differed significantly. The groups also differed in their PTSD symptoms, $F(2, 337) = 25.8, p < .005$, with follow-up analyses supporting that all three groups differed significantly. In addition, there were significant differences among groups on all three types of posttraumatic cognitions: self-cognitions, $F(2, 337) = 25.8, p < .005$; world cognitions, $F(2, 337) = 25.8, p < .005$; self blame, $F(2, 337) = 25.8, p < .005$. Follow-up pairwise comparisons supported that over-accommodated victims differed from the other two groups on negative self-cognitions and self blame. In contrast, all three groups differed in world cognitions. With regard to risky behaviors, there were no differences among victim groups in hazardous alcohol use, $F(2, 313) = 0.7, p = .47$. In contrast, there were significant differences among groups in use of sexual activity to reduce negative affect, $F(2, 328) = 4.6, p < .05$, with follow-up pairwise comparisons supporting that accommodated and over-accommodated victims differed significantly.

A total of 250 women (75%) provided an email address to be contacted to participate in the follow-up survey. Of these women, 105 (42%) completed the follow-up. Women who completed and those who did not complete the follow-up (either because they did not provide an email address or because they did not respond to the email solicitation) were compared. There were no significant differences between completers and non-completers on any variables analyzed. Among women completing the follow-up, 21% were classified as assimilated, 25% were classified as accommodated, and 54% were classified as over-accommodated. There were no significant differences in the percentage of women in each group reporting they were re-victimized during the follow-up period, $\chi^2(2) = 3.8, p = .15$, with 41% of assimilated victims, 22% of accommodated victims, and 44% of over-accommodated victims reporting re-victimization.

Discussion

Results were consistent with Littleton's (2007) prior findings with participants' coping patterns best fitting the three expected response patterns (assimilated, accommodated/accommodating, and over-over-accommodated). In the current sample, a total of 22% of victims were classified as assimilated. As predicted, these victims overall reported lower utilization of all coping strategies compared to the other groups. Interestingly, their most frequently used strategy was problem avoidance; this may reflect these victims' efforts to maintain their belief that they were not seriously affected by the trauma by avoiding assault-related thoughts and feelings. Alternatively, because assimilated victims view the trauma as a more benign experience, they may feel less need to devote extensive active coping efforts to manage it. Assimilated victims also reported the lowest level of distress and less

adherence to negative trauma-related schemas than the other two victim groups. While these victims reported the lowest level of distress, they engaged in similar levels of potential re-victimization risk behaviors as the other groups. This finding suggests that assimilated victims may not have attempted to reduce their likelihood of experiencing further assaults by changing potentially risky behaviors (e.g., binge drinking) they were engaging in prior to the index assault. In addition, while there were not significant differences among any of the victim groups in their likelihood of experiencing re-victimization, assimilated victims reported very high rates of re-victimization at follow-up. Thus, assimilated victims appeared similarly vulnerable to re-victimization as compared to the other groups of victims. These victims were also the least likely of the three groups to conceptualize their experience as a victimization, supporting that one strategy used by these women to integrate this experience into their schemas was to minimize the severity of the experience. Finally, there were some differences in the assault characteristics of assimilated and over-accommodated victims, with assimilated victims reporting less violent assaults. One possible explanation of this finding is that it is easier for victims to minimize the severity and impact of a less violent assault. Another possibility is that assimilated victims may be less likely to conceptualize the assailant's behavior as physical force (e.g., lying on top of the victim) or their behaviors as resistance (e.g., turning cold).

A total of 34% of victims in the sample were classified as accommodated/accommodating. As expected, these women reported greater utilization of all coping strategies than assimilated victims and were particularly likely to utilize emotional approach strategies. Given that these victims are attempting to fit the traumatic experience into their schematic beliefs, it is not surprising that they reported engaging in strategies to manage their emotional responses related to the assault. While accommodated/accommodating victims reported similar levels of depression as assimilated victims, they reported greater PTSD symptoms than assimilated victims. In contrast, they reported less depression and PTSD than over-accommodated victims. Accommodated/accommodating victims also reported more negative world cognitions than assimilated victims, but not more negative self-cognitions or self-blame. Thus, overall, accommodated/accommodating victims appeared to be more distressed by the assault than assimilated victims, but not to be experiencing as maladaptive an adjustment pattern as over-accommodated victims. In addition, accommodated/accommodating victims were experiencing some negative trauma-related schema changes but not reporting the highly distressing self-related schema changes of over-accommodated victims. Accommodated/accommodating victims also reported less use of sexual activity to regulate their negative affect than over-accommodated victims, and while not significant, reported the lowest level of re-victimization among the three groups during the follow-up period.

Over-accommodation was the most common response pattern among participants, with 45% of participants classified as over-accommodated. This could reflect the fact that the experience of sexual assault is likely to represent a serious challenge to individuals' extant schemas as it involves a serious violation of one's personal integrity and trust of others; especially as most participants were at least acquainted with their assailant. In addition, victims of sexual assault frequently experience multiple victimizations including multiple sexual assaults and sexual victimization in childhood, and these repeated experiences may make it especially difficult to maintain positive schematic beliefs. Indeed, over half of the over-accommodated victims reported a sexual abuse history and were significantly more likely than accommodated/accommodating victims to report such a history. As predicted, these women reported very high levels of avoidance coping strategies and less utilization of approach coping. They also were the lowest functioning, reporting the highest level of depression and PTSD symptoms. Consistent with the notion that over-accommodation reflects maladaptive schema change; these victims reported the highest level of all negative

trauma-related schemas. Potentially reflecting maladaptive affect management strategies, over-accommodated victims also reported high levels of hazardous drinking and using sex as an affect regulation strategy, reporting engaging in this behavior significantly more than accommodated/accommodating victims. Over-accommodated victims also reported high rates of re-victimization over the follow-up period.

Limitations of the study should be noted. First, the study involved a sample of college sexual assault victims, and thus may not generalize to other victim groups. In addition, the response rate for the follow-up survey was quite low, although not inconsistent with general response rates to web surveys (Cook, Heath, & Thompson, 2000). However, as a result of the low follow-up rate we had limited power to detect differences among the victim groups with regard to their likelihood of experiencing re-victimization. The current study also relied exclusively on self-report data and was not supplemented by a clinical interview. Finally, participants were asked to recall details of the assault as well as to characterize their overall coping with the assault and thus the data may have been subject to recall bias.

Bearing these limitations in mind, the results of this study have a number of implications for future research and intervention. First, results support that there are multiple response patterns among victims of sexual assault and that these response patterns have important implications for post assault recovery and re-victimization risk given that victims' response patterns were associated with their distress levels, adherence to trauma-related schemas, and potentially to their likelihood of engaging in re-victimization risk behaviors. This suggests that dividing victims into two groups (e.g., distressed or non-distressed, adaptively or maladaptively coping) is likely to be inadequate at capturing the full range of outcomes following trauma. Thus, future research should continue to capitalize on advances in statistical modeling techniques to identify and evaluate these multiple response patterns. Results also suggest that some individuals who appear to be functioning "well" following trauma may actually be at risk for long-term negative outcomes such as re-victimization risk because they are engaging in behaviors that potentially place them at risk or are unable to recognize risky situations, although this finding clearly warrants further validation. As an example, like prior research (Benson, Gohm, & Gross, 2007; Corbin, Bernat, Calhoun, McNair, & Seals, 2001; Kaysen, Neighbors, Martell, Fossos, & Larimer, 2006), victims in the current study reported very high levels of hazardous drinking behavior. There is also a clear need for further research focused on identifying the predictors of victims' response patterns. Finally, results support that interventions may need to be tailored somewhat to victims based on their response patterns. For example, over-accommodated victims may benefit from behavioral techniques (e.g., exposure) and cognitive restructuring techniques focused on assisting them in modifying maladaptive schemas, perhaps followed by risk reduction interventions if necessary. In contrast, accommodating victims may be especially likely to benefit from a combination of stress management and supportive interventions (such as offered as part of stress inoculation therapy) in addition to cognitive techniques to assist them in adaptively accommodating the traumatic experience into their extant schemas. Finally, assimilated victims may, in particular, be likely to benefit from cognitive techniques focused on aiding them in integrating the trauma into their schemas in an adaptive way, as well as techniques focused on assisting them at recognizing and changing behaviors that potentially place them at risk for further victimization (e.g., ending a relationship with the perpetrator, reducing hazardous drinking, enhancing assertiveness skills). Research and intervention in these areas will help increase the likelihood of ensuring positive recovery for all victims.

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Table 1

Results of the One Class, Two Class, Three Class, and Four Class LPA Models Utilizing Participants' Adaptive and Maladaptive Assault-Related Coping Scores

	BIC	Entropy	L-M-R LRT
One class solution	9123.44	N/A	N/A
Two class solution	9011.92	0.66	160.91***
Three class solution	8984.35	0.73	54.84***
Four class solution	8981.00	0.77	31.42

*
 $p < .05$,

**
 $p < .01$,

 $p < .005$

BIC = Bayesian information criteria, L-M-R LRT = Lo-Mendell-Rubin likelihood ratio test

Table 2

Mean Coping Scores of Participants Classified by LPA as Assimilated, Accommodated/ Accommodating, and Over-Accommodated

	Assimilated (<i>n</i> = 70)	Accommodated (<i>n</i> = 117)	Over-Accommodated (<i>n</i> = 153)
Problem engagement	18.59 ^a	24.27 ^{a,b}	18.39 ^b
Emotion engagement	16.43 ^a	30.50 ^{a,b}	17.56 ^b
Problem disengagement	21.33 ^a	23.51 ^a	30.75 ^a
Emotion disengagement	14.50 ^a	17.71 ^a	21.00 ^a

Means that share superscripts differ significantly at $p < .05$, Bonferroni-adjusted

Table 3

Prevalence of Various Characteristics in the Assaults of Participants Classified into the Three Response Clusters

	Assimilated (<i>n</i> = 70)	Accommodated (<i>n</i> = 117)	Over-Accommodated (<i>n</i> = 153)
Threats by the assailant	13%	12%	21%
Moderate force by the assailant	47% ^a	64%	71% ^a
Severe force by assailant	4%	7%	6%
Non-verbal resistance	49% ^a	56%	66% ^a
Verbal resistance	31%	39%	46%
Physical resistance	29%	44%	41%
Romantic relationship with assailant	41%	29%	34%
Binge drinking by victim	49%	57%	43%
Binge drinking by assailant	42%	51%	39%
Assault less than one year ago	32%	40%	31%
Assault one to two years ago	15%	15%	16%
Unacknowledged	78% ^{a,b}	60% ^a	55% ^b
Continued relationship with assailant	40%	25%	30%
Sexual abuse history	54%	41% ^a	58% ^a

Means that share superscripts differ significantly at $p < .05$, Bonferroni-adjusted

Table 4

Scores among Participants Classified in the Three Response Clusters on the Distress, Cognitions, Alcohol Use, and Sex as Affect Regulation Strategy Measures

	Assimilated <i>M</i> (<i>SD</i>)	Accommodated <i>M</i> (<i>SD</i>)	Over-Accommodated <i>M</i> (<i>SD</i>)
CES-D	11.4 (10.0) ^a	13.9 (10.9) ^b	21.6 (12.1) ^{a,b}
PSS-SR	5.1 (6.9) ^a	8.7 (9.0) ^a	14.3 (10.7) ^a
Self cognitions	41.6 (16.4) ^a	44.8 (19.7) ^b	66.9 (27.0) ^{a,b}
World cognitions	24.2 (10.2) ^a	28.6 (10.0) ^a	33.7 (9.1) ^a
Self blame	14.0 (5.6) ^a	14.9 (6.6) ^b	20.3 (6.6) ^{a,b}
AUDIT	6.4 (4.2)	5.7 (3.6)	5.8 (4.0)
Sex to reduce negative affect	9.9 (4.6)	9.2 (4.3) ^a	11.1 (5.5) ^a

Means that share superscripts differ significantly at $p < .05$, Bonferroni-adjusted