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Social support predicts reductions in PTSD symptoms when substances are not used to cope: A longitudinal study of sexual assault survivors

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Abstract

Background—After sexual assault, many college women develop symptoms of posttraumatic stress disorder (PTSD), and those who engage in substance use coping are at heightened risk for this outcome. Positively-perceived social support has been identified as an important protective factor against the development of PTSD, but received social support could involve problematic behaviors—like the encouragement of coping through use of alcohol and/or drugs—that could worsen symptoms.

Methods—In the current study, 147 undergraduate women with a lifetime history of sexual assault completed two waves of self-report measures assessing their symptoms. We test main and interaction effects for social support and substance use coping at baseline on PTSD symptoms one month later.

Results—Results suggest that social support is longitudinally associated with decreases in PTSD. Although substance use coping did not evidence a direct association with PTSD, the relationship between social support and PTSD was significantly weaker as substance use coping increased. Only support from friends (but not family members or a “special person”) was associated with later PTSD, and this relationship was moderated by substance use coping.

Limitations—Substance use coping was assessed via a brief measure, and peer encouragement of coping by using alcohol and/or drugs was not directly assessed.

Conclusions—Clinicians should consider ways to increase access to social support from friends in patients with PTSD and evaluate ways that substance use coping may interfere with social support's benefits.

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Keywords

drinking; alcohol; drug use; rape; childhood sexual abuse; trauma

Estimates suggest that about 21% of women report sexual assault (SA) during college (Krebs et al., 2016), and SA is associated with substantially increased risk for posttraumatic stress disorder (PTSD) and substance use disorders among survivors (Dworkin et al., 2017). Heavy drinking and other forms of problem substance use are widespread on college campuses (Johnston et al., 2016; Nelson et al., 2009). College women who experience SA often report using substances to cope with assault-related distress (Miranda et al., 2002). This is problematic because coping via substance use is associated with elevated PTSD symptoms over time in SA survivors (Read et al., 2014; Ullman et al., 2013, 2005). Thus, the overlap of substance use coping and PTSD may be especially problematic among college students with a history of SA. Given the high prevalence of SA among college students, it is important to identify risk and protective factors for PTSD following SA in this population.

Social support—defined as the degree to which support is available in general from people including friends, family members, and romantic partners—is one potential protective factor. *Perceived social support* includes subjective perceptions of the quality and availability of general support, and *received social support* reflects the degree to which actual supportive behaviors are offered by others. Received support can reflect both negative (e.g., blaming, distraction) and positive (e.g., tangible aid, information support) behaviors. When provided in specific response to needs related to SA, received support is known as “social reactions” (Ullman, 2010). It is important to note that perceptions of social support do not necessarily correspond to the quality of received support, so social support may be perceived positively even in the presence of negative received social support (e.g., some survivors report positive perceptions of victim blame) (Dworkin et al., 2016).

Perceived social support has been negatively associated with PTSD symptoms in quantitative and qualitative reviews of risk and protective factors for PTSD after trauma in general (Brewin et al., 2000; Ozer et al., 2003; Wagner et al., 2016) and empirical research on SA (Borja et al., 2006). That is, individuals who perceive higher levels of social support tend to have lower PTSD symptoms, and vice versa. Emerging micro-longitudinal evidence suggests that the negative association between PTSD symptom severity and perceived social support is present even on a day-to-day basis (Dworkin et al., *in press*), suggesting that it is a robust and important relationship. Further, perceived social support evidences larger associations with PTSD symptoms than pre-trauma factors (e.g., history of other trauma exposure, family history of psychopathology, prior adjustment, socioeconomic status, intelligence, race) (Brewin et al., 2000; Ozer et al., 2003). This has important implications given that, unlike these pre-trauma factors, perceived social support is a potential target for post-trauma intervention. Perceived social support might be a particularly important protective factor in the aftermath of SA given the interpersonal nature of sexual trauma and its associated stigma (Ullman, 2010). In addition, emotionally supportive behaviors from friends are more strongly associated with post-SA adjustment than emotionally supportive behaviors from other sources (e.g., family members, mental health professionals) (Filipas

and Ullman, 2001; Ullman, 1999). Moreover, college women are more likely to seek support from their informal social support network following SA as opposed to formal responders, such as law enforcement (Fisher et al., 2003), making social support a critical target for research among college women specifically.

Negative received social support has also been associated with higher PTSD symptomatology over time (Ullman and Peter-Hagene, 2014). In particular, received social support may be harmful when those providing social support encourage or fail to discourage survivors' maladaptive strategies to cope with distress, such as by encouraging use of substances (Schwarzer and Knoll, 2007). Substance use coping can maintain or worsen PTSD (Ullman et al., 2013, 2005) by, for example, interfering with the use or effectiveness of adaptive coping strategies (e.g., approach-oriented coping). In college environments, where substance use is common and using substances to cope may be normative (Christiansen et al., 2002; Park and Levenson, 2002), close social relationships increase risk for substance use (Mason et al., 2014), likely because they create more opportunities to use substances to cope (i.e., in social settings) or because these relationships may encourage substance use coping (e.g., by peers). Peers providing social support to trauma-exposed college students may encourage substance use in response to distress (a form of avoidance coping) instead of adaptive coping strategies like emotional expression.

Indeed, there is evidence that perceived and received social support are associated with substance use in young trauma-exposed adults (Bachrach and Read, 2017; Gros et al., 2016). A study of young veterans with PTSD and a substance use disorder identified a positive association between alcohol use and perceived social support, and the authors explained that this finding might be explained by the high frequency of drinking in this population (Gros et al., 2016). Further, trauma-exposed college students with elevated weekday PTSD symptoms who had friends who offered drinks (a form of received social support) were more likely to report weekend drinking consequences than those with friends who did not offer drinks (Bachrach and Read, 2017). This indicates that peer encouragement of substance use as a form of received support could have important psychological consequences in trauma-exposed populations. However, substance use coping remains untested as a moderator of the association between either form of social support and PTSD.

In sum, social support (both perceived and received) appear to be negatively associated with PTSD, but there is reason to believe that social support could be less protective for college women with a history of SA who use substances to cope. Further, because college students are likely to report drinking with peers (Christiansen et al., 2002; Park and Levenson, 2002), support from peers (as opposed to other sources of support, like family members) may be particularly likely to involve the encouragement of substance use coping in this population. This possibility has received minimal research attention. In this study, we use a longitudinal approach to test main and interaction effects for the relationship between perceived social support and using substances (alcohol or drugs) to cope at baseline and PTSD at follow-up. We first tested a model reflecting overall perceived social support from a variety of sources (Model 1) and made three hypotheses. First, we hypothesized that overall perceived social support would be significantly negatively related to PTSD (H1). Second, using substances to cope would be significantly positively related to PTSD in Model 1 (H2). Third, overall

perceived social support would be less strongly related to PTSD for participants who use substances to cope more frequently (H3) in Model 1. Because we expected substance use coping to moderate the specific relationship between peer social support and PTSD, rather than support from other sources, we tested a second model (Model 2) that reflected the perceived quality of social support from three specific sources: friends, family members, and a special person. Relevant to this model, we hypothesized that perceived social support from each source would be significantly negatively related to PTSD (H4). We hypothesized that using substances to cope would remain significantly positively related to PTSD in Model 2 (H5). Finally, we hypothesized that perceived social support from friends, but not family members or a special person, would be less strongly related to PTSD for participants who use substances to cope more frequently (H6).

Method

Procedures

Procedures were approved by the University of Washington institutional review board. The sample included $N = 147$ undergraduate women aged 18 or above at a Northwestern university who completed a baseline assessment, 30 days of symptom monitoring, and a follow-up assessment at 30 days for a larger study (Kaysen et al., 2014). A total of 11,544 women were randomly selected to receive an invitation to participate in an internet-based screening survey. Of those who received an invitation, 4,342 completed the screening and 860 met study criteria of (a) consuming >4 drinks on one occasion at least two times in the past month (this criterion effectively identifies individuals with alcohol and/or drug use disorders; Dawson et al., 2010), and (b) reporting either (b1) no history of trauma or (b2) a lifetime history of SA (i.e., SA that occurred in childhood, adolescence, and/or adulthood) and at least one intrusive and one hyperarousal PTSD symptom in the past month. Of these women, 834 completed a premonitoring questionnaire and were invited to complete the daily monitoring and a follow-up questionnaire. Of 202 participants who completed the follow-up questionnaire, we included the 147 participants who endorsed a history of SA and the aforementioned PTSD symptoms (16 participants were excluded due to missing data).

Participants

The mean age for the sample was 20.32 years old ($SD = 2.09$). Participants identified as White (71.2%), Asian/Pacific Islander (12.3%), multi-ethnic (9.6%), other (4.1%), Black/African American (2.1%), or Native American/American Indian (0.7%). There were no bivariate differences on PTSD symptom severity, social support, or substance use coping as a function of age or race. There was a range for time since worst SA, with the worst SA occurring less than one month prior (2.7%), 1-3 months prior (6.8%), 3-6 months prior (15.0%), 6 months to 3 years prior (39.5%), 3-5 years prior (17.0%), or more than 5 years prior (19.0%). Similarly, participant's most recent SA had occurred less than one month prior (3.4%), 1-3 months prior (4.8%), 3-6 months prior (15.6%), 6 months to 3 years prior (50.3%), 3-5 years prior (13.6%), or more than 5 years prior (12.2%). A substantial minority of participants (39.5%) reported experiencing SA both before and since age 14.

Measures

Demographics—Self-report demographic items assessed age and race.

Sexual assault—Adolescent/adult SA, defined as attempted or completed “unwanted oral–genital contact, vaginal/anal intercourse, and/or penetration by objects” since the age of 14 was assessed at screening using a modified Sexual Experiences Survey (Koss and Gidycz, 1985). Eighteen experiences were listed and response options were 1 (yes) and 0 (no). The 11-item Childhood Victimization Questionnaire (Finkelhor, 1979) was used to assess childhood sexual abuse, which was defined as coercive/forced sexual activity (ranging from a sexual invitation to intercourse) before age 14 with someone 5+ years older. Participants were asked how long ago the worst SA occurred as well as the timeframe for the occurrence of the most recent SA. Response options were <1 month, 1–3 months, 3–6 months, 6 months to 3 years, 3–5 years, and 5+ years. PTSD symptoms were assessed as related to participants' self-identified worst SA.

Posttraumatic stress—The Posttraumatic Diagnostic Scale (Foa et al., 1997) assessed self-reported PTSD symptom severity at baseline and follow-up. Participants were asked to indicate the extent to which each of the 17 DSM-IV PTSD symptoms bothered them in the last month in relation to their worst SA. Response options ranged from 0 (not at all) to 3 (almost always). This scale demonstrated good internal consistency reliability at baseline ($\alpha = .88$) and follow-up ($\alpha = .89$).

Substance use coping—The substance use coping subscale of the Brief COPE (Carver, 1997) was administered at baseline and included two items: “I’ve been using alcohol or other drugs to make myself feel better” and “I’ve been using alcohol or other drugs to help me get through it.” Possible responses ranged from 1 (I haven’t been doing this at all) to 4 (I’ve been doing this a lot). This subscale had excellent internal consistency reliability among trauma-exposed adults ($\alpha = .90$) (Carver, 1997) and in the current study ($\alpha = .93$).

Social support—Social support was assessed at baseline using the 12-item Multidimensional Scale of Perceived Social Support (Zimet and Dahlem, 1988). Participants rated statements regarding perceived positive social support from three sources (i.e., family, friends, a “special person”) on a scale from 0 (strongly disagree) to 5 (strongly agree). Each of the three sources of social support form a separate subscale, comprised of four items reflecting different types of support. For example, the items comprising the friend subscale were as follows: “Your friends really try to help you,” “You can count on your friends when things go wrong,” “You have friends with whom you can share your joys and sorrows,” and “You can talk about your problems with your friends.” Responses were summed to create subscale scores and an overall scale score. The overall scale demonstrated excellent internal consistency in the current sample ($\alpha = .91$), as did the subscales (friends $\alpha = .94$, family $\alpha = .92$, special person $\alpha = .94$).

Analyses

Analyses were conducted in R version 3.3.1 (R Development Core Team, 2014). The regression models included main and interaction effects for social support and substance use

coping at baseline and were tested using the MASS package (Venables and Ripley, 2002). Models controlled for baseline PTSD symptom severity. We examined bivariate associations between the dependent variable and time since participants' worst and most recent SA to determine whether these variables should be controlled for in models. Time since most recent SA evidenced a trend-level association with PTSD severity, $r = -0.15$, $p = .07$, whereas no relationship was observed for time since worst SA, $r = -0.02$, $p = .83$. Based on these associations, we chose to control for time since most recent SA in analyses. Because the dependent variable was a count variable, a negative binomial distribution was selected for both models.

Results

Variable descriptives and intercorrelations are reported in Table 1. Perceived social support (both overall and from each specific source) and substance use coping were significantly negatively correlated at baseline. Overall social support, as well as social support from friends and family, were significantly negatively correlated with PTSD at both baseline and follow-up; no significant association was observed for social support from a special person. Substance use coping was significantly positively correlated with PTSD at both time points. Participants reported perceiving significantly more support from friends (mean difference = 1.84, $SE = 0.60$, $p = .002$) and a special person (mean difference = 1.70, $SE = 0.60$, $p = .005$) than from family, and friends and a special person were perceived as providing similar amounts of support (mean difference = 0.14, $SE = 0.60$, $p = .819$).

Multivariate model results are presented in Table 2. In Model 1, overall perceived social support at baseline was negatively associated with PTSD symptoms at follow-up, in support of H1. That is, participants who had more perceived overall social support tended to report lower PTSD symptoms one month later. Inconsistent with H2, substance use coping was not associated with PTSD symptoms at follow-up. In support of H3, a significant interaction effect emerged for substance use coping and social support at baseline. Investigation of the plot of this interaction (Figure 1) indicated that, as substance use coping decreased, the strength of the association between social support and PTSD increased, such that individuals reporting higher levels of substance use coping were less likely to evidence a negative relationship between social support and later PTSD than individuals at lower levels of substance use coping. In terms of covariates, PTSD symptoms at baseline were significantly positively related to PTSD symptoms at follow-up, and time since most recent SA was not associated with PTSD symptoms at follow-up.

In Model 2, social support from friends, but not family members or a “special person,” was significantly negatively associated with later PTSD, in partial support of H4. That is, individuals who reported higher levels of support from friends tended to evidence lower levels of PTSD symptomatology one month later, whereas this relationship was not observed for family members or a “special person.” Inconsistent with H5, substance use coping was not associated with PTSD symptoms at follow-up. In support of H6, a significant interaction effect was observed for substance use coping and social support from friends, but not family or a special person. Specifically, individuals reporting higher levels of substance use coping were less likely to evidence a negative relationship between social support from friends and

later PTSD than individuals at lower levels of substance use coping. PTSD symptoms at baseline were significantly positively related to PTSD symptoms at follow-up, and time since most recent SA was not associated with PTSD symptoms at follow-up.

Discussion

This study examined social support as a longitudinal predictor of PTSD symptoms among college women who had been sexually assaulted. Although substance use coping has been identified as a risk factor for PTSD in past studies (Read et al., 2014; Ullman et al., 2013, 2005), this was the first study to assess interactions between social support and substance use coping. Results suggest that social support—and particularly, support received from friends—is potentially an effective buffer against PTSD symptoms for college women with a history of SA, but substance use coping may interfere with benefits associated with social support.

Perceived social support was associated with less PTSD over time, and social support from friends appeared to be more strongly associated with PTSD than social support from other sources. Specifically, overall perceived social support was significantly negatively associated with later PTSD (in support of H1), but when specific sources of support were examined, friend support—but not family or “special other” support—evidenced a significant negative relationship with later PTSD (in partial support of H4). This replicates previous findings on the positive effects of perceived social support following trauma (Brewin et al., 2000), and demonstrates that these effects can be present in short assessment time frames (i.e., across one month). It also adds new evidence to the limited body of work on the relative importance of different sources of support, which has suggested that emotionally supportive behaviors from friends are more strongly associated with reduced distress after SA than similar behaviors from other sources (Filipas and Ullman, 2001; Ullman, 1999).

Substance use coping was not prospectively related to PTSD symptoms in this study, inconsistent with our hypotheses. Although a bivariate relationship between substance use coping and PTSD symptoms was observed at both baseline and follow up, no statistically significant relationship was observed in either multivariate model (against H2 and H5). Although substance use coping and PTSD have been shown to be related in cross-sectional research on SA survivors (Ullman et al., 2005), it has not been tested longitudinally. Cross-sectional designs may overestimate the effects of SA by failing to distinguish between conditions caused by SA and conditions that predate SA (Briere, 1992). It is also possible that substance use broadly, rather than substance use as a coping style specifically, is related to PTSD symptoms longitudinally. Future research should investigate these possibilities.

It appears that the positive effects of social support may be tempered in the presence of substance use coping, as is consistent with our hypotheses. Specifically, for women who used substances to cope, there was a significantly weaker relationship between overall social support at baseline and PTSD symptom severity at follow-up (in support of H3). When multiple sources of social support were considered, this moderated relationship was observed for perceived support from friends, but not family members or a special person (in support of H6). There are two potential explanations for this finding. First, in a college

environment, higher levels of social support from friends in particular may maintain substance use coping behaviors, which could prevent recovery from PTSD. Although some college students report drinking alone (Christiansen et al., 2002) and loneliness has been associated with substance use (Åkerlind and Hörnquist, 1992; Stickley et al., 2014), most college students who drink endorse drinking in social situations (Christiansen et al., 2002), and research suggests that peers influence drinking behavior among college students with PTSD specifically (Bachrach and Read, 2017). Thus, SA survivors with more social support from their friends may have more opportunities to use substances to cope, or may receive more support involving encouragement to do so. For example, SA survivors expressing distress could be invited by those providing social support to participate in activities involving substance use to distract them from their distress (Bachrach and Read, 2017). This may prevent them from identifying more helpful coping strategies (e.g., exposure to avoided thoughts and feelings) which, over time, may maintain or worsen PTSD symptoms (Ullman et al., 2005). Second, high levels of substance use coping might interfere with the helpfulness of social support. Students who perceive high levels of support may be less willing and/or able to receive that support if they are using substances. For example, they may use substances instead of interacting with friends, family members, and others. This is consistent with the theory that available support must be actually received to be helpful (Schwarzer and Knoll, 2007). Notably, though, coping via substance use was not a significant predictor of PTSD symptoms when accounting for social support, suggesting that social support may be a more powerful correlate of PTSD symptoms than substance use coping.

It is possible that the differential importance of various sources of support identified in this study may be unique to college students. Most students attending US college campuses that offer on-campus housing, like the campus from which the current sample was drawn, do not live with their parents (Turley and Wodtke, 2010). Although we did not collect data on students' living situation, other research using this university population found that only 19% of students lived with their parents (Geisner, 2008). As a result, friends and significant others may be more available as in-person sources of support for college students. Indeed, in this sample, family members were perceived as providing relatively less support than friends and a "special person." In populations where family members are able to provide more in-person support (e.g., adolescents, students attending commuter colleges), it is possible that these effects would differ. For example, a study of veterans found that perceived support from significant others, family members, and military peers, but not friends, was negatively associated with PTSD symptom severity (Wilcox, 2010). However, it is unclear whether support from family members would similarly interact with substance use coping, given that family members are presumably less likely than college-aged peers to encourage substance use coping. Future research should investigate the importance of friends versus other sources of support after SA in different populations.

These findings suggest that interventions that aim to increase access to social support from friends may be beneficial for some college women with a history of SA. Clinicians working with survivors of SA on college campuses should assess social support and evaluate how substance use coping interfaces with social support. For example, consistent with existing interventions for substance use disorders (e.g., Litt et al., 2009; Marlatt and Gordon, 1985),

clinicians could explore how certain friends encourage or discourage using substances to cope, aim to add sober individuals to one's network, or evaluate how using substances to cope interferes with access to social support. Then, clinicians could help women plan alternative coping responses. Among women who do not use substances to cope, it may be beneficial to identify strategies to increase social support. Some interventions that aim to increase perceived social support have reported beneficial effects (Hogan et al., 2002). On a broader scale, interventions on college campuses could help students identify ways that they can be helpful in encouraging adaptive coping if approached by a friend experiencing distress related to SA (e.g., encouraging emotional expression, avoiding substance use in response to distress). Although no such intervention has been tested, there is a long history of involving supportive peers, partners, or family members in psychological interventions for a variety of conditions, with beneficial effects observed in some studies (Hogan et al., 2002).

A significant strength of this study is the longitudinal design and assessment of a population at high risk for both SA and substance use coping. It also is strengthened by its inclusion of coping items specifically related to substance use coping, as opposed to avoidance coping more generally. However, there are also several limitations to note, including the brief assessment of substance use coping, and the exclusion of both men (given their lower SA risk) and those who exclusively use drugs. We also assessed substance use coping generally rather than coping via alcohol use specifically. Given that there is some evidence for differential relationships between various types of substances of abuse and PTSD symptom patterns (Dworkin et al., 2018), better understanding the role of alcohol use coping versus general substance use coping as related to PTSD and drinking behavior should be a goal of future research. However, many college students use alcohol to cope (Park and Levenson, 2002), which suggests the substance-use coping measure may reflect drinking specifically rather than substance use generally in this population. In addition, we did not assess the type (e.g., emotional support vs. instrumental support) of social support provided, including whether perceived support was actually received. It is possible that subjective perceptions of the availability of social support could have been affected by distress at the time of survey participation, although we attempted to account for this confound by controlling for PTSD symptom severity at baseline. We also did not assess whether those providing social support encouraged substance use. Future research should assess the degree to which SA survivors are encouraged to engage in substance use coping by their peers. In addition, social support and substance use coping were only assessed at baseline, so these results do not account for changes in both over time. Future longitudinal research could help to clarify this issue. Finally, although there is evidence from prospective longitudinal research that the relationship between social support and PTSD symptoms changes as a function of time since trauma (Kaniasty and Norris, 2008), our lack of a prospective design precluded within-person examinations of moderation by time since SA. Although we controlled for time since most recent SA, future prospective longitudinal research on this topic could clarify the role of time since trauma.

In sum, these findings suggest that, after SA, social support is protective against PTSD for college women, and may be particularly protective among women who do not use substances to cope. Interventions that aim to increase social support in survivors of SA on

college campuses are likely to be beneficial, but substance use behavior should be considered when promoting social support access among college women following SA.

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Highlights

College women exposed to sexual assault completed two waves of self-report measures

Social support was longitudinally associated with decreases in PTSD

The social support-PTSD relationship was weaker for women using substances to cope

Figure 1. Substance Use Coping Moderates Social Support-PTSD Relationship in Multivariate Model

Table 1

Descriptive Statistics and Intercorrelations

Variable	<i>M</i> (<i>SD</i>)	Range	1	2	3	4	5	6	7
1. PTSD (baseline)	13.83 (8.37)	2-36							
2. PTSD (follow-up)	16.16 (9.26)	0-42	0.62**						
3. Social support-Overall	43.33 (11.97)	3-60	-0.26**	-0.31**					
4. Social support-Friends	15.10 (4.43)	0-20	-0.34**	-0.35**	0.76**				
5. Social support-Family	13.27 (5.62)	0-20	-0.18*	-0.28**	0.80**	0.42**			
6. Social support-“Special person”	14.97 (5.20)	0-20	-0.11	-0.11	0.79**	0.44**	0.41**		
7. Substance use coping	3.73 (1.81)	2-8	0.28**	0.34**	-0.35**	-0.38**	-0.28**	-0.19*	
8. Time since most recent SA	4.03 (1.13)	1-6	-0.08	-0.15	0.16	0.13	0.12	0.12	-0.09

* $p < .05$,** $p < .01$

Table 2
Multivariate Models Predicting PTSD Symptom Severity at Follow-Up

Model 1	B (SE)	p
Intercept	2.950 (0.361)	<.0001
Social support- Overall	-0.018 (0.007)	.015
Substance use coping	-0.079 (0.068)	.248
Substance use coping × Social support	0.003 (0.002)	.042
PTSD severity (baseline)	0.033 (0.005)	<.0001
Time since most recent SA	-0.030 (0.034)	.382
<i>Model 2</i>		
Intercept	3.031 (0.376)	<.0001
Social support- Friends	-0.057 (0.024)	.019
Social support- Family	-0.010 (0.020)	.610
Social support- "Special person"	0.008 (0.021)	.696
Substance use coping	-0.093 (0.069)	.179
Substance use coping × Social support- Friends	0.011 (0.005)	.034
Substance use coping × Social support- Family	0.000 (0.005)	.939
Substance use coping × Social support- "Special person"	-0.001 (0.005)	.859
PTSD severity (baseline)	0.033 (0.005)	<.0001
Time since most recent SA	-0.026 (0.034)	.446