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Social Support, Coping, and Posttraumatic Stress Symptoms in Women Sexual Assault Survivors: A Longitudinal Analysis

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Abstract

Social support and coping affect each other after stressful life events, including sexual assault (Taylor & Stanton, 2007). The present study examined the associations among assault-specific support, maladaptive coping, and posttraumatic stress symptoms (PTS) over 3 years in a sample of women sexual assault survivors from a large metropolitan area (N= 1,863). A 3-wave cross-lagged panel model revealed significant weak to moderate reciprocal associations between maladaptive coping and PTS (β s = .09 to .21), significant weak reciprocal associations between turning against social reactions and PTS (β s = .07 to .10), and inconsistent weak reciprocal associations (β s = .06 to .14). We conclude with implications regarding treatment and intervention for survivors and their support networks.

Individual and social network factors affect adjustment to traumatic events including sexual assault (Taylor & Stanton, 2007). According to stress and coping theory, coping and support that are mobilized following stressful life events may interact with each other and influence mental health outcomes (Lazarus & Folkman, 1984). Sexual assault survivors often receive both positive support (e.g., being believed) and negative forms of support (e.g., victim blame) following sexual assault (Ullman, 2000). Survivors who receive negative social reactions following disclosure report higher levels of posttraumatic stress (PTS) symptoms (e.g., reexperiencing, avoidance, numbing, hyperarousal) and maladaptive coping (e.g., coping strategies such as denial or substance use that may help alleviate symptoms temporarily yet may be harmful over time), and these effects pertain over and above the contributions of general social support (Relyea & Ullman, 2015; Ullman, Townsend, Filipas, & Starzynski, 2007). In prior cross-sectional analyses of data from a study of women exposed to sexual assault, we found that both maladaptive coping and PTS were related to each other and to two types of negative reactions: overtly turning against a survivor (i.e., blame and stigma) and providing unsupportive acknowledgment of an assault (i.e., reactions that may show concern yet provide ineffective or potentially harmful support such as telling the survivor to stop thinking about the assault; Relyea & Ullman, 2015). However, much of this research has been cross-sectional. Understanding the associations among these variables requires more sophisticated longitudinal analyses. Furthermore, such research is important

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for identifying modifiable psychosocial factors that can be targeted in treatment and intervention with sexual assault victims.

Only three studies of which we are aware have examined longitudinal associations among these variables with sexual assault survivors. First, in prior longitudinal analyses, we found that PTS and negative social reactions in general have bidirectional influences (Ullman & Peter-Hagene, 2016), whereas in a sample of 64 college women, Littleton (2010) found negative social reactions in general predicted PTS symptoms over a 6-month follow-up. However, longitudinal associations with each type of negative support were not tested in past studies. Whereas being turned against by others may be stressful, the literature is not clear about why support providers would respond negatively to survivors with PTS or why receiving unsupportive acknowledgment may relate to PTS. One possibility may be maladaptive coping, which has a mutually reinforcing relation with PTS (Badour, Blonigen, Boden, Feldner, & Bonn-Miller, 2012).

A second previous 2-wave longitudinal study showed that maladaptive coping prospectively predicted negative reactions (Ullman & Najdowski., 2011). How a survivor copes may affect how others provide support (Dunkel-Schetter & Skokan, 1990; Relyea & Ullman, 2015; Silver, Wortman, & Crofton, 1990). For instance, support providers who believe a survivor is coping poorly (e.g., using substances to cope) may attempt to control the survivor's decisions or even stigmatize survivors (Relyea & Ullman, 2015). Although the prior longitudinal studies did not separate out the two types of negative reactions, we found in cross-sectional analyses that unsupportive acknowledgement was more strongly related to maladaptive coping than turning against reactions (Relyea & Ullman, 2015). We hypothesized that unsupportive acknowledgment may increase maladaptive attempts to cope because such reactions acknowledge the survivor's assault without providing the support systems needed to cope adaptively. Some unsupportive acknowledgment reactions may even encourage avoidance coping through telling survivors to stop thinking or talking about the assault. Researchers have yet to examine bidirectional longitudinal associations between PTS, maladaptive coping, and the different kinds of social reactions.

The longitudinal analyses presented in this manuscript utilize one previously described data set to examine how PTS, maladaptive coping, and negative social reactions relate over time. Given prior findings, we hypothesized that maladaptive coping and PTS would have a bidirectional association in sexual assault survivors. We also hypothesized that being turned against, yet not unsupportive acknowledgment, would predict more PTS. Rather, we expected unsupportive acknowledgment to predict more maladaptive coping. Finally, we expected survivors who engaged in maladaptive coping would report receiving more of both types of negative reactions.

Method

Participants and Procedure

Participants were recruited from community, college, and agency sources using advertisements, fliers, listservs, and Craigslist. Women age 18 or older who had undergone unwanted sexual experiences at or after age 14 and who had told at least one person about

the assault were eligible to participate. Women completed a series of 3 mail surveys regarding assault circumstances, social reactions, coping strategies, and PTS including an initial survey (Time 1: T1), and 2 follow-ups, one at 1 year later (Time 2: T2) and one follow-up at 2-years postbaseline (T3). Response rates were as follows: T1: 85.0%, T2: 72.0%, T3: 56.0%). The study was approved by the UIC Social and Behavioral Sciences IRB and used written informed consent forms.

The final sample include N = 1,863 women who returned surveys at T1, among whom 1,012 women completed all three waves. In a prior study, we found that the sample that completed all three waves did not differ from the full sample aside from being slightly older (Ullman & Peter-Hagene, 2016). Participants ranged in ages from 18 to 71 years (M = 36.51, SD = 12.54). The sample was racially and ethnically diverse: 44.9% African-American, 35.2% White, 2.0% Asian, 7.0% multiracial and 10.9% other, unknown, or unreported; 13.2% reported Latina or Hispanic ethnicity, which was assessed separately. There were 31.5% of women who reported having a college degree, 41.8% had some college education, and 26.1% had a high school degree or less. Less than half were employed (42.6%) and a majority had household annual incomes below US\$30,000 (67.9%).

Measures

Unwanted sexual experiences were assessed with a revised version of the Sexual Experiences Survey (SES-R; Testa et al., 2004) which demonstrated internal consistency reliability of $\alpha = .78$ in our sample). All women reported some form of sexual assault as adults: 12.4% unwanted contact or coercion; 86.6% attempted or completed rape, or other unwanted sexual experiences not specified (1.1%).

Posttraumatic stress symptoms (PTS)—We assessed PTS using the 17-item standardized Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1995) based on *Diagnostic and Statistical Manual* (DSM-IV) criteria (American Psychiatric Association, 2000). At T1, Participants rated the frequency of their symptoms (i.e., reexperiencing/intrusion, avoidance/ numbing, hyperarousal) over the past 12 months in relation to their most serious sexual assault on a scale from 0 = never or only one time to 3 = almost always. The PDS has acceptable test–retest reliability for a PTSD diagnosis in assault survivors over 2 weeks ($\kappa = .74$; Foa, Cashman, Jaycox, & Perry, 1997) and demonstrated good internal consistency in our sample with $\alpha = .93$. At T2 and T3, instructions asked about symptoms "since the last survey." Items were summed to create a total score.

Maladaptive coping—Participants reported coping strategies employed to deal with the sexual assault using the Brief COPE (Carver, 1997) scale. Maladaptive coping was a composite of eight items capturing four types of strategies: denial (provide example of items for each strategy); behavioral disengagement; substance use; and self-blame. At T1, participants rated how often they used each strategy over the past 12 months on a scale from $1 = I \operatorname{didn}'t \operatorname{do} this \operatorname{at} \operatorname{all}$ to $4 = I \operatorname{did} this \operatorname{a} \operatorname{lot}$. At T2 and T3, instructions asked about coping strategies used "since the last survey." The results were summed, with higher scores indicating more maladaptive coping. Internal consistency of the scale was good, with $\alpha = .$ 81 in our sample.

Social reactions—The 48-item Social Reactions Questionnaire (SRQ; Ullman, 2000) assessed social reactions survivors received from others when disclosing assault. The T1 instructions asked about reactions survivors received when telling others at any time since their assaults. At T2 and T3, the instructions asked about reactions "since the last survey." Participants rated how often they received each reaction on a Likert-type scale from 0 = never to 4 = always. Per Relyea and Ullman (2015), reactions were divided into three general scales by averaging items: a 13-item *turning against the survivor* scale, 13-item *unsupportive acknowledgment* scale, and a 20-item *positive reactions* scale ($\alpha s = .92$, .85, and .92 respectively). For all scales, higher scores indicate a greater frequency of receiving that kind of reaction.

Control variables—All control variables were from T1 and were included as constants because past research shows them to be related to PTS and/or other variables in the model. We assessed history of *life traumas* (e.g., physical abuse, robbery) with the Stressful Life Experiences Questionnaire-Revised (SLESQ-R; Green, Chung, Daroowalla, Kaltman, & DeBenedictis, 2006) with added questions assessing stalking (T. Logan, personal communication, 2007) and community violence (Relyea & Ullman, 2015) We excluded items related to sexual assault given that was assessed separately (M = 5.90, SD = 3.25). Childhood sexual abuse (CSA) was assessed with the 11-item Sexual Experiences Survey-Revised (SES-R; Testa, VanZile-Tamsen, Livingston, & Koss, 2004). Answers were dichotomized with 66% reporting any CSA experiences on the SES-R, which ranged from unwanted fondling/touching to completed rape. We also used items from the SES-R to create two parallel dichotomized variables to indicate whether participants reported any revictimization in the past 12 months at T2 and T3. We also controlled for years since the most serious sexual assault (M = 14.23, SD = 11.42, range = 0-54), whether participants perceived their *life was in danger* during assault (with 57% saying yes), and *level of violence* experienced during assault (an ordinal scale from 0 = "insistence" to 6= "a weapon").

Data Analysis

All analyses were performed using the statistical program R, Version 3.2.4 (R Core Team, 2012). Descriptive statistics and bivariate correlations used non-imputed data (Table 1). Listwise deletion would have only produce 434 participants, reducing power and introducing bias. We therefore used multiple imputation with 10 imputed data sets and 5% ridge priors (Honaker, King, & Blackwell, 2011). To estimate missing values, we included all model variables and variables that were highly associated with the missing variables. At T1: age, education, years since assault, income, number of adult assaults on the SES-R, and posttraumatic growth (10-item PTGI-S; Cann et al., 2010). At all timepoints: assault disclosure and desire to participate in future surveys (each scored: no/yes at any timepoint), depression (7-item version of CES-D modified by Mirowsky and Ross, 1990) alcohol problems (the 25-item MAST, Selzer, 1971), character self-blame (5-item RAQ; Frazier, 2003), emotional dysregulation (six items from DERS, Gratz & Roemer, 2004), positive individual and social coping (12 and 4 items respectively from Brief Cope; Carver, 1997).

To examine the associations among PTS, maladaptive coping, and social reactions over three years, we performed a cross-lagged path analysis. We began with a null model that had no

cross-lagged associations and sequentially tested the addition of cross-lagged predictors until ending in a fully cross-lagged model. In all models, T1 variables were regressed on all covariates from T1; T2 and T3 variables were regressed on the covariates for T2 and T3 revictimization, respectively. Residual variances between PTS, social reactions, and maladaptive coping were correlated across variables within each timepoint. Beginning with the null model, we proceeded in steps, first testing the associations between PTS and maladaptive coping, then PTS and reactions, and finally maladaptive coping and reactions. At each step we were able to test the associations between two variables by examining each unidirectional path separately, then testing the reciprocal paths. Once reciprocal paths were added into a model (e.g., PTS and maladaptive coping) we retained these paths to test all remaining models. PTS and maladaptive coping were entered first as they have been studied the most; we then added reactions and PTS, as one prior study found evidence of a reciprocal effect (Ullman & Peter-Hagene, 2016). Finally we examined the paths between maladaptive coping and reactions as no studies of which we are aware have examined their reciprocal effects. To compare nested models, we performed multivariate Wald tests as there is no standard for combining log likelihood ratio tests following multiple imputation and Wald tests are asymptotically equivalent to the likelihood ratio test. We also follow Hu and Bentler's (1999) criteria for good model fit (i.e., CFI and TLI above .95, RMSEA below .06, SRMR below .08). For all models, we used the lavaan package 0.5-20 in R, Version 3.2.4 (R Core Team, 2012) using maximum likelihood estimation with the semTools .04-11 and Amelia II 1.7.4 packages to combine the results for the multiply imputed datasets.

Results

Table 1 shows descriptive statistics and intercorrelations among continuous variables. Overall, repeated measures ANOVA indicated that PTS, maladaptive coping, and all forms of social reactions declined over the 3 years. Cross-sectional correlations were in line with prior findings; PTS and maladaptive coping were strongly correlated. Also, PTS symptoms and maladaptive coping both had moderate correlations with negative social reactions (turning against and unsupportive acknowledgment) yet weak to no association with positive reactions.

Null Model

The null model with no cross-lagged paths and autoregressive paths only from contiguous timepoints (T3 to T2, T2 to T1) demonstrated poor fit, $\chi^2(125) = 679.72$, TLI = .90, CFI = . 94, RMSEA = .05, SRMR = .10. We added autoregressive paths between T1 and T3 to account for the effect of prior experiences at T1 increasing the chances of similar experiences at T3. The paths from T1 to T3 were significant for all variables and the multivariate Wald test was significant, $\chi^2(5) = 461.35$, p < .001. This also yielded improved fit, $\chi^2(120) = 461.47$, TLI = .94, CFI = .96, RMSEA = .04, SRMR = .08. Therefore, these paths were left in the model.

PTS and Maladaptive Coping

We next examined the associations between maladaptive coping and PTS. Adding unidirectional cross-lagged paths from PTS to maladaptive coping resulted in significant

effects for each path with a significant multivariate Wald test, $\chi^2(2) = 133.58$, p < .001, and a good model fit, $\chi^2(118) = 396.02$, TLI = .95, CFI = .97, RMSEA = .03, SRMR = .07. Adding paths from maladaptive coping to PTS also resulted in significant paths and a significant Wald test, $\chi^2(2) = 85.72$, p < .001, with a similar model fit, $\chi^2(118) = 419.40$, TLI = .94, CFI = .97, RMSEA = .03, SRMR = .07. Finally, adding reciprocal paths between PTS and maladaptive coping resulted in a modest improvement, of fit $\chi^2(116) = 370.24$, TLI = .95, CFI = .97, RMSEA = .03, SRMR = .07. In support of hypotheses, all reciprocal paths between maladaptive coping and PTS were significant. Wald tests showed the reciprocal paths added to each of the unidirectional path models to be significant at the p < .001 level. Paths from PTS to maladaptive coping appeared stronger than paths from maladaptive coping to PTS, but a Wald test indicated no differences between these, $\chi^2(2) = 4.36$, ns.

PTS and Social Reactions

Controlling for reciprocal paths between PTS and maladaptive coping, we then looked at the associations between PTS and social reactions. Adding cross-lagged paths from reactions to PTS slightly improved the model fit, $\chi^2(110) = 345.57$, TLI = .95, CFI = .98, RMSEA = .03, SRMR = .07). Although the overall Wald test was significant, $\chi^2(6) = 47.18$, p < .001, turning against reactions alone prospectively predicted PTS. Conversely, adding paths from PTS to reactions showed that PTS positively predicted all forms of social reactions, had a significant Wald test, $\chi^2(6) = 144.12$, p < .001, and improved all model fit statistics, $\chi^2(110)$ = 296.94, TLI = .96, CFI = .98, RMSEA = .03, SRMR = .05). The reciprocal paths path between PTS and reactions showed a modest improvement, $\chi^2(104) = 273.43$, TLI = .96, CFI = .96, RMSEA = .03, SRMR = .04. Although all paths between PTS and reactions remained significant, in support of hypotheses, only turning against reactions predicted PTS. Wald tests indicated the bidirectional model was stronger than either of the unidirectional path models, p < .001. A Wald test showed no differences between the strength of the paths from PTS to turning against reactions or the reverse paths, $\chi^2(2) = 2.80$, *ns*. Therefore, these results suggest that bidirectional relation between PTS and negative reactions found in a prior study (Ullman & Peter-Hagene, 2016) may be accounted for by the association of turning against reactions to PTS. Whereas survivors with higher levels of PTS symptoms reported later receiving higher levels of all forms of social reactions, only turning against reactions resulted in future trauma symptoms.

Maladaptive Coping and Social Reactions

Controlling for all bidirectional paths between both PTS and maladaptive coping, and social reactions and PTS, we finally tested the associations between maladaptive coping and social reactions. Adding paths from reactions to maladaptive coping showed partial support for hypotheses. Although the overall Wald test was significant, $\chi^2(6) = 55.86$, p < .001, and the model slightly improved fit, $\chi^2(98) = 245.92$, TLI = .97, CFI =.98, RMSEA = .03, SRMR = .04. Unsupportive acknowledgment reactions predicted increased maladaptive coping only from T2 to T3 and positive reactions predicted reduced maladaptive coping from T1 to T2. Turning against reactions did not predict later maladaptive coping. The reverse unidirectional paths from maladaptive coping to reactions significant according to the Wald test, $\chi^2(6) = 53.42$, p < .001, with similar model fit, $\chi^2(98) = 245.47$, TLI = .97, CFI =.98, RMSEA = .03, SRMR = .04. Maladaptive coping was related to increased unsupportive

acknowledgment during both cross-lagged timepoints and increased turning against

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reactions from T1 to T2. Lastly, the reciprocal model showed similar path coefficients and similar fit statistics, $\chi^2(92) = 218.24$, TLI = .97, CFI = .98, RMSEA = .03, SRMR = .04. Wald tests showed the bidirectional model was stronger than the unidirectional path models at p < .001. In partial support of hypotheses, only unsupportive acknowledgement reactions both predicted (from T2-T3), and were predicted by maladaptive coping (at both T1-T2 and T2-T3). The Wald test showed that the paths from maladaptive coping to unsupportive acknowledgment to maladaptive coping, $\chi^2(2) = 7.49$, p = .024. Therefore, the association between maladaptive coping and unsupportive acknowledgement appeared to be driven more by the effect of maladaptive coping on unsupportive acknowledgement than the reverse association.

The Wald test showed that maladaptive coping and PTS had equally strong effects on increasing turning against reactions, $\chi^2(2) = 0.14$, *ns*, and unsupportive acknowledgement, $\chi^2(2) = 1.35$, *ns*, yet PTS predicted more positive reactions than did maladaptive coping, $\chi^2(2) = 6.80$, p = .033. This final, fully cross-lagged model among PTS, maladaptive coping, and reactions is shown in Figure 1. We present only the prospective and significant paths for clarity.

Discussion

Social support and coping are intimately connected to mental health outcomes of exposure to trauma, including sexual assault (Taylor & Stanton, 2007). Research shows that postassault social reactions, coping, and PTS are related in sexual assault survivors, but few prospective studies of these associations exist. This is the only 3-wave study of which we are aware of a large diverse sample of sexual assault survivors from the community testing how social reactions, maladaptive coping, and PTS are associated over time. Results indicated that negative reactions exerted effects on PTS and maladaptive coping and that these symptoms and coping strategies in turn may lead to individuals receiving more negative reactions. Specifically, we found that PTS had equally strong bidirectional associations with both maladaptive coping and turning against social reactions, such as victim blame. We also showed that survivors who engaged in more maladaptive coping consistently received more unsupportive acknowledgement reactions, such as others taking control from them, and that such reactions predicted maladaptive coping from T2 to T3 (yet not T1 to T2),

These findings extend the literature by showing directional relations over time. Similar to past studies, maladaptive coping and PTS had a reciprocal association (Badour et al., 2012). This study could not determine whether it would be more useful for treatments to target coping or PTS to break this cycle, but this would be a valuable question for future research. In support of prior studies, we found that either PTS or maladaptive coping may lead to negative reactions (Ullman & Najdowski., 2011; Ullman & Peter-Hagene, 2016). However, we also found these effects varied by the type of negative reaction. Whereas PTS equally predicted both turning against and unsupportive acknowledgment reactions, maladaptive coping more consistently related to survivors receiving unsupportive acknowledgment. Support providers may have a difficult time knowing how to assist survivors who are experiencing distress or engaging in maladaptive coping. Therefore, treating survivors'

distress and teaching survivors to cope adaptively may help limit negative responses from social networks (Dunkel-Schetter & Skokan, 1990; Silver et al., 1990). This does not obviate the need to teach informal support providers to respond positively even to highly distressed survivors.

The results also suggest that programs should train support providers how to provide positive support, and avoid negative reactions, particularly when survivors are engaging in maladaptive coping (Edwards & Ullman, 2016). This study clarified an earlier finding regarding negative reactions and PTS (Ullman & Peter-Hagene, 2016) by showing that turning against reactions, but not unsupportive acknowledgment, had reciprocal influence with PTS. Reducing such hostile reactions may be critical to ameliorating survivors' PTS symptoms. Also, this is the first study of which we are aware to show that survivors who received unsupportive acknowledgment increased maladaptive coping whereas positive reactions decreased maladaptive coping. Therefore, focusing only on survivors may not be adequate without addressing the support networks who can facilitate or thwart survivors' coping efforts. Such an approach is ecologically-informed and acknowledges that survivors alone are not responsible for their recovery, but are embedded in networks of social relationships affecting their recovery (Campbell, Dworkin & Cabral, 2009).

The study had several limitations. First, the study used a voluntary community sample of women sexual assault survivors. Survivors who engaged in higher levels of avoidance coping may not have been as likely to participate. We also used a self-report measure of PTSD symptoms and such findings may not generalize to women clinically diagnosed with PTSD. In addition, for participants in this study, the levels of PTS, maladaptive coping, and all forms of reactions decreased over the 3 years of the study and thus findings may not be generalizable to survivors who have more chronic PTS. Future studies should assess whether the levels of PTS, coping, and reactions affect their interrelations. Finally, when using multiple imputation, we used moderate sized ridge priors to stabilize the expectation-maximization algorithm. Such priors reduce the strength of correlations. Thus, our estimates of the associations among variables likely are lower than would be found with complete data. However, this may also be a benefit given that our results are more conservative.

Overall, the results of this study suggest that treatment approaches attempting to address posttraumatic stress symptomatology in the aftermath of sexual assault need to address social reactions from social network members that affect survivors' coping strategies and symptoms over time. Enhancements are warranted to traditional treatments, such as cognitive behavioral therapy, in order to also address social reactions survivors may receive, how to cope with such responses, and how to target disclosures to supportive sources.

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Figure 1.

Cross-lagged path model of social reactions (positive, turning against, and unsupportive acknowledgment), posttraumatic stress symptoms (PTS), and maladaptive coping showing only significant prospective paths. All coefficients are standardized and statistically significant (p<.05). Autoregressive paths indicated with dashed lines. For clarity, non-significant paths, cross-sectional correlations, and covariates (CSA, traumas, education, level of violence, life threat, revictimization) are not shown.

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	03	.14 **	.06*	.44	.26 **	00 [.]	.01	.02	.39 **	.23 **	03	04	.01
	.66	.44	.40 **	.27 **	.51 **	.35 **	.33 **	.28**	.26**	.44	.29**	.24 **	.28**
		.36**	.35 **	.05	.31 **	.44	.35 **	.24 **	.06 ^t	.26**	.36**	.29 **	.25 **
			.55 **	.21 **	.36**	.32 **	.64 ^{**}	.46**	.21 ^{**}	.36**	.29 **	.58**	.48**
			I	.12**	.34 **	.31 **	.46 **	.57 **	** 60 [.]	.31 **	.27 **	.40 **	.56**
				I	.59**	.21 **	.15**	.14 **	.51 **	.33 **	** 60.	.10**	.16**
						.68	.33 **	.35 **	.36**	.56**	.37 **	.29 **	.39**
						ł	.38 **	.32 **	** 60 [.]	.36**	.49 ^{**}	.34 **	.35 **
								.60 ^{**}	.16**	.30**	.30**	.73**	.51 **
								I	.16**	.32**	.25 **	.51 **	.64 **
									1	.61 **	.23 **	.18**	.13 **
											.72 **	.34 **	.36**
												.37 **	.32 **
												I	.59**
	1,604	1,729	1,742	1,248	1,257	1,253	1,271	1,274	930	930	936	977	971
	0.81	21.14	16.32	1.72	0.72	0.40	16.68	14.75	1.61	0.66	0.38	15.40	14.35
	0.93	12.94	5.77	1.17	0.79	0.71	11.99	5.65	1.21	0.80	0.71	12.15	5.69
	62	63	81	95	88	63	63	83	96	06	63	.94	84

Table 1

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p < .05.p < .01.p < .01.