

## SHAME DURING SOCIAL INTERACTIONS PREDICTS SUBSEQUENT GENERALIZED ANXIETY SYMPTOMS: A DAILY-DIARY STUDY

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**Objectives:** To explore the relationship between shame experiences and generalized anxiety symptoms, using a daily-diary design. **Method:** Forty undergraduate students (mean age = 22.4) completed an online survey, once a day, for eight consecutive days, retrospectively assessing the extent to which they experienced shame during a significant social interaction on a given day, and the extent to which they experienced subsequent GAD symptoms later that day. **Results:** Using a multilevel regression model we found, as expected, that higher day-level and person-level shame were significantly associated with more subsequent GAD symptoms. Furthermore, we found that participants who experienced more GAD symptoms during the daily-diary period were more reactive to daily changes in shame. **Conclusions:** Findings are consistent with the hypothesis that worrying may serve to facilitate avoidance of shame-related experiences.

*Keywords:* Shame, Worry, Generalized anxiety disorder, Daily diaries

Prominent models of generalized anxiety disorder (GAD) propose that worrying serves to regulate painful internal experiences (Behar, DiMarco, Hekler, Mohlman, & Staples, 2009). For

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example, the avoidance model of worry and GAD (Borkovec, Alcaine, & Behar, 2004) argues that worrying is a verbal-linguistic activity that allows individuals to avoid more vivid and threatening mental images. More recent models of GAD, such as the emotion dysregulation model (Mennin, Heimberg, Turk, & Fresco, 2005) and the acceptance-based model of GAD (Roemer & Orsillo, 2002), also view worry as an experiential avoidance regulatory strategy.

One important question remains largely unaddressed by these models: What is the specific emotional content that people with GAD are trying to avoid? Two recent studies suggest that this emotional content might be shame-related (Fergus, Valentiner, McGrath, & Jencius, 2010; Schoenleber, Chow, & Berenbaum, 2014). Shame is a self-conscious emotion that is experienced when individuals perceive themselves to be inadequate, worthless, or inferior, and it motivates them to withdraw and hide in order to conceal their perceived flaws and avoid social exclusion (Gilbert, 1998; Lewis, 1971; Tangney & Dearing, 2002). Moreover, shame has been receiving increased attention as a transdiagnostic process that is associated with a range of psychopathologies (Pineles, Street, & Koenen, 2006; Tangney, Wagner, & Gramzow, 1992).

In the first of the aforementioned studies examining the relationship between shame and GAD, Fergus et al. (2010) calculated partial correlations between shame-proneness and symptoms of several anxiety disorders. These authors found that shame-proneness predicted GAD and social anxiety disorder (SAD) symptoms after statistically accounting for depressive symptoms, other anxiety disorders symptoms, and guilt-proneness. In this analysis, shame-proneness did not predict obsessive-compulsive disorder (OCD) and panic disorder (PD) symptoms. In addition, reductions in shame-proneness during treatment (largely exposure-based treatment) predicted improvements in SAD, GAD, and OCD symptoms. In the second study, Schoenleber et al. (2014) found that intolerance of shame emerged as an important predictor of worry (measured with the Penn State Worry Questionnaire; Meyer, Miller, Metzger, & Borkovec, 1990) using a cross-sectional design. These studies provide preliminary evidence suggestive of the notion that individuals with

GAD struggle with feelings of shame, which might underlie their tendency to worry.

Therefore, the goal of the current study was to further examine the relationship between shame and GAD symptoms, using a daily-diary design. Specifically, we assessed the extent to which nonclinical individuals experienced shame and acted submissively, a display indicative of shame (Keltner & Harker, 1998) during a significant social interaction on a given day and the extent to which these experiences predicted subsequent GAD symptoms later that day. Specifically, we predicted that (a) experiencing more shame during the social interaction will predict more GAD symptoms following the interaction, (b) that individuals who are generally more shame-prone (i.e., report experiencing more shame during the entire daily-diary period) will report more daily GAD symptoms, and (c) that individuals who are generally more anxious (i.e., report higher levels of GAD during the entire daily-diary period) will be more reactive to shame compared to less anxious individuals.

## METHOD

### PARTICIPANTS

The sample consisted of 40 undergraduate students (mean age = 22.41,  $SD = 2.80$ ; 60% females) from a private college in Herzliya, Israel. The sample included international students residing in Israel who came from Germany ( $N = 10$ ), Israel ( $N = 10$ ), United States ( $N = 7$ ), United Kingdom ( $N = 4$ ), Italy ( $N = 3$ ), Switzerland ( $N = 1$ ), Singapore ( $N = 1$ ), Denmark ( $N = 1$ ), The Netherlands ( $N = 1$ ), Thailand ( $N = 1$ ), and Spain ( $N = 1$ ). Thirty participants were single, eight were in a committed relationship, and two were married. In terms of racial/ethnic background, 38 participants were White and two were Asians.

### PROCEDURE

Participants attended an introductory session during which they learned about the study procedures, signed consent forms, and completed a demographic questionnaire and several other ques-

tionnaires assessing GAD symptoms and depressive symptoms. They were then instructed to complete an online survey, once a day, as close as possible to bedtime, on the following eight consecutive days. Because each submitted survey had a time stamp we could verify that only one survey per day was submitted.

## MEASURES

*Overview of the Daily Survey.* The daily survey asked participants to think about the most significant social interaction they had that day and answer several questions regarding that interaction, such as what time the interaction occurred, where it occurred, how long it lasted, and who was present. Next, participants were asked to indicate the extent to which they behaved submissively and the extent to which they experienced a number of affects during the interaction (see more details below). Finally, they reported how much time had passed from the end of the interaction until the time they were completing the survey, and the extent to which they experienced GAD symptoms during this elapsed time.

*Daily Shame.* Daily shame consisted of three indices: (a) the extent to which participants engaged in submissive behaviors during the interaction, (b) the extent to which participants reported feeling ashamed during the interaction, and (c) the extent to which participants reported feeling inferior during the interaction. Submissive behaviors were assessed using seven items taken from the 16-item submissive behavior scale (SBS; Allan & Gilbert, 1997). These seven items were chosen because of high loadings reported in Allan and Gilbert (1997) and were adapted for use in a daily-diary (for example, the item "I blush if people stare at me" was changed to "I blushed if someone stared at me"). Participants indicated the extent to which they engaged in each behavior during the social interaction on a scale ranging from 0 (not at all) to 4 (extremely). Items were summed and the range was 0–28.

Feeling ashamed and inferior were assessed using single affect items. These affects were part of a longer list of affects, and participants indicated the extent to which they experienced each

affect during the interaction on a scale of 1 (not at all) to 7 (extremely).

To test whether these three daily indicators of shame tapped the same construct, we ran a principle component analysis. This analysis yielded one factor with an eigen value of 1.82 which explained 60.6% of the variance. All three indicators loaded very highly on this factor (0.75 for inferior, 0.83 for ashamed, and 0.75 for submissive behaviors). Therefore, we used the factor score for each subject's entry as an index of daily shame during the interaction.

*Daily Generalized Anxiety Disorder Symptoms.* Daily levels of generalized anxiety symptoms were assessed using the seven-item Generalized Anxiety Disorder Scale (GAD-7; Spitzer, Kroenke, Williams, & Lowe, 2006). Participants were asked to indicate the extent to which they experienced each of the symptoms since the end of the interpersonal interaction on a scale of 0 (not at all) to 4 (nearly all the time). Scores on the seven items were summed and total scores ranged from 0 to 21. The GAD-7 has been widely used and has very good psychometric properties.

*Approach to Data Analysis.* Because our data had a multilevel structure (days nested within persons), we used a multilevel regression model using SAS PROC MIXED. We were interested in predicting daily variability in GAD symptoms by both between-person and within-person variability in shame (i.e., the degree to which participants were characterized by more or less shame over the course of the daily-diary period, and the degree to which a certain day was characterized by more or less shame compared to the person's average level of shame). A first-order autoregressive structure was imposed on the within-person residual covariance matrix. The intercept and the slope were considered to be random, allowing the estimation of their variances as well as their co-variance.

The day-level within-individual (Level 1) equation was:

$$GAD_{ik} = \beta_{0i} + \beta_{1i} * Shame_{ik} + e_{ik}$$

Where  $GAD_{ik}$  is the predicted outcome for participant  $i$  on day  $k$ ,  $\beta_{0i}$  is the regression intercept for this participant (reflecting the

subject's GAD level on days with an average degree of Shame),  $\beta_{1i}$  is the regression slope for the effect of shame on GAD for this participant,  $\text{Shame}_{ik}$  is the daily level of shame for this participant on this particular day, and  $e_{ikj}$  is a residual component for this participant on this particular day. Shame was centered on each participant's own mean, so effects could be interpreted as changes in GAD associated with deviation from the participant's average shame.

To examine the between-person effect of shame, we included each participant's mean level of the shame in Level 2 of the models; this was centered on the sample's grand mean.

The person-level between-individual (Level 2) equations were:

$$\beta_{0i} = \gamma_{00} + \gamma_{01} * \text{Average Shame}_j + u_{0i}$$

$$\beta_{1i} = \gamma_{10} + u_{1i}$$

In these equations, the intercept ( $\beta_{0i}$ ) of subject  $i$  is predicted by the fixed effects (i.e.,  $\gamma_{00}$ ; the outcome level for the average person), by his or her average level of shame (i.e.,  $\gamma_{01} * \text{Average Shame}_j$ ) and by his or her random effects (i.e.,  $u_{0i}$ ; his or her deviation from the fixed effect). The slope ( $\beta_{1i}$ ) of subject  $i$  is predicted by the fixed effects (i.e.,  $\gamma_{10}$ ; the effect of daily shame for the average person), and by his or her random effects (i.e.,  $u_{1i}$ ; his or her deviation from the fixed effect).

## RESULTS

### DESCRIPTIVE STATISTICS

Overall, 235 daily surveys were completed. After nine participants who completed 4 days or less were excluded from the analysis, the average number of daily surveys completed was 5.88 ( $SD = 1.10$ ). Interaction length in minutes ranged from one minute to 960 minutes ( $M = 98.56$ ,  $SD = 137.53$ ).<sup>1</sup> The number of minutes passing from the end of the interaction to the time when the participant completed the survey ranged from 0 minutes (there were three occasions in which a participant reported

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1. We ran the analysis after removing all days with interactions shorter than 10 minutes and the results remained the same.

TABLE 1. Fixed (Top) and Random (Bottom) Estimates of the Multilevel Model

Parameter Estimates	Estimate	SE	DF	<i>p</i> value
Fixed Effects				
Intercept ( $\gamma_{00}$ )	1.96	0.27	35.1	<0.001
Average Shame ( $\gamma_{01}$ )	0.99	0.37	27.7	0.013
Daily Shame ( $\gamma_{10}$ )	1.56	0.43	25.4	0.001
Random Effects				
Level 1 (days)				
Autoregression	0.22	0.09		0.020
Residual	6.58	0.90		<0.001
Level 2 (subjects)				
Intercept	1.31	0.84		0.059
Slope	3.59	1.56		0.011
Intercept/Slope Covariance	2.29	0.82		0.005

Note. *p* values for fixed effects were based on two-tailed t-tests with Satterthwaite approximation method for computing DF; *p* values for random effects were based on one-tailed Wald z-test, because variances are constrained to be non-negative.

that the interaction had not yet ended when he/she began to complete the survey) to 1440 minutes ( $M = 329.54$ ,  $SD = 332.19$ ).

PRIMARY ANALYSIS

Results of the hierarchical linear models are presented in Table 1. Higher levels of shame during the social interaction predicted more GAD symptoms following the interaction. In addition, participants characterized by higher levels of shame, averaged across the entire daily-diary period, experienced more daily GAD symptoms. Finally, we found a positive association between the intercept and the daily shame-GAD slope. As mentioned before, the intercept reflects each participant’s average level of GAD symptoms across the daily-diary period. This correlation indicates that participants who experienced more GAD symptoms during the daily-diary period also had a stronger (positive) slope between shame and GAD symptoms (i.e., they were more reactive to daily changes in shame). We also ran the model while statistically accounting for depressive symptoms, measured at the introductory meeting with the Depression Scale of the 21—item version of the Depression Anxiety Stress Scale

(DASS-21; Antony, Bieling, Cox, Enns, & Swinson, 1998; Henry & Crawford, 2005) and the pattern of results remained the same.

## DISCUSSION

This study examined the daily relationship between experiences of shame during significant social interactions and GAD symptoms following the interactions. Consistent with recent studies that have shown a link between shame and GAD symptoms using cross-sectional designs (Fergus et al., 2010; Schoenleber et al., 2014), the current study demonstrated this link using a more ecologically valid, daily-diary design. Specifically, our results showed that experiencing feelings of shame and inferiority, and acting submissively during a significant social interaction on a given day, predicted subsequent GAD symptoms later that day. Also, individuals who experienced more shame overall during the eight-day period reported feeling more anxious. Finally, those who were more anxious overall during the eight-day period were more reactive to shame; i.e., they reported more GAD symptoms on days when they experienced more shame, compared to less-anxious participants. Thus, among more-anxious participants, shame seemed to trigger more GAD symptoms on a given day.

These findings may have important theoretical and therapeutic implications. First, consistent with current GAD models that emphasize the avoidant function of worrying (Behar et al., 2009; Borkovec et al., 2004), these findings suggest that worrying may facilitate avoidance of more painful feelings of inadequacy, inferiority, and worthlessness (shame-related feelings). These findings are also consistent with data showing that GAD is associated with emotional abuse histories (Kessler, Davis, & Kendler, 1997; Soenke, Hahn, Tull, & Gratz, 2009), as emotional abuse has been shown to predict later shame internalization (Claesson & Sohlberg, 2002; Gilbert, Allan, & Goss, 1996; Kim, Talbot, & Cicchetti, 2009; Stuewig, & McCloskey, 2005). We do not propose that shame is the only underlying emotion that individuals with GAD are trying to avoid, however the findings of the current and previous studies imply that shame is a central emotion, at least to some extent and for some sufferers.



From a therapeutic standpoint, our findings suggest that focusing on shame during treatment for GAD might improve outcomes. One of the central assumptions in Borkovec's avoidance theory of GAD (Borkovec et al., 2004) is that worry is reinforced because it reduces arousal in the short term, but it also prevents adaptive processing of the underlying, more painful emotional experiences. The current study suggests that it might be important to develop therapeutic interventions particularly designed to facilitate productive shame processing during treatment for GAD.

Several limitations should be considered. First, although we used a daily-diary design, assessment of the experiences during the social interactions and GAD symptoms following the interaction relied on retrospective recall at the end of the day. Therefore, the results are still subject to memory biases, and the exact temporal relationship between shame and GAD symptoms cannot be determined. Future daily-diary studies should use truly prospective designs with multiple assessments per day. Second, using a nonclinical sample precludes generalizing the results to clinical populations of individuals with GAD. The results of this study await replication with analogue and clinical samples. Finally, it should be noted that shame is a transdiagnostic process and not specific only to GAD. Therefore, although our results suggest that shame might be central in GAD, it might also be useful to think more broadly about the transdiagnostic role of shame, as well as its specific association with worrying.

In summary, GAD is considered a poorly understood and difficult to treat anxiety disorder (Fisher, 2006). It is possible that more accurately specifying the painful emotional content that people with GAD are trying to avoid will enhance our theoretical understanding of etiological and maintenance processes in GAD and help design therapeutic interventions that will enhance the efficacy of GAD treatment. The current study suggests that shame might be an important emotion that is avoided through worrying.

## REFERENCES

- Allan, S., & Gilbert, P. (1997). Submissive behaviour and psychopathology. *British Journal of Clinical Psychology*, 36, 467–488. doi:10.1111/j.2044-8260.1997.tb01255.x
- Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the depression anxiety stress scales in clinical groups and a community sample. *Psychological Assessment*, 10, 176–181. doi:10.1037/1040-3590.10.2.176
- Behar, E., DiMarco, I. D., Hekler, E. B., Mohlman, J., & Staples, A. M. (2009). Current theoretical models of generalized anxiety disorder (GAD): Conceptual review and treatment implications. *Journal of Anxiety Disorders*, 23, 1011–1023. doi:10.1016/j.janxdis.2009.07.006
- Borkovec, T. D., Alcaine, O. M., & Behar, E. (2004). Avoidance theory of worry and generalized anxiety disorder. In R. G. Heimberg, C. L. Turk, & D. S. Merin (Eds.), *Generalized anxiety disorder: Advances in research and practice* (pp. 77–108). New York: Guilford.
- Claesson, K., & Sohlberg, S. (2002). Internalized shame and early interactions characterized by indifference, abandonment and rejection: Replicated findings. *Clinical Psychology & Psychotherapy*, 9, 277–284. doi:10.1002/cpp.331
- Fergus, T. A., Valentiner, D. P., McGrath, P. B., & Jencius, S. (2010). Shame- and guilt-proneness: Relationships with anxiety disorder symptoms in a clinical sample. *Journal of Anxiety Disorders*, 24, 811–815. doi:10.1016/j.janxdis.2010.06.002
- Fisher, P. L. (2006). The efficacy of psychological treatments for generalised anxiety disorder? *Worry and its psychological disorders: Theory, assessment and treatment* (pp. 359–377). Hoboken, NJ: Wiley Publishing. doi:10.1002/9780470713143.ch20
- Gilbert, P. (1998). What is shame? some core issues and controversies. In P. Gilbert & B. Andrews (Eds.), *Shame: Interpersonal behavior, psychopathology, and culture. Series in affective science* (pp. 3–38). New York: Oxford University Press.
- Gilbert, P., Allan, S., & Goss, K. (1996). Parental representations, shame, interpersonal problems, and vulnerability to psychopathology. *Clinical Psychology & Psychotherapy*, 3, 23–34. doi:10.1002/(SICI)1099-0879(199603)3:1<23::AID-CPP66>3.0.CO;2-O
- Henry, J. D., & Crawford, J. R. (2005). The short-form version of the depression anxiety stress scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology*, 44, 227–239. doi:10.1348/014466505X29657
- Keltner, D., & Harker, L. (1998). The forms and functions of the nonverbal signal of shame. In P. Gilbert & B. Andrews (Eds.), *Shame: Interpersonal behavior, psychopathology, and culture. Series in affective science* (pp. 78–98). New York: Oxford University Press.
- Kessler, R. C., Davis, C. G., & Kendler, K. S. (1997). Childhood adversity and adult psychiatric disorder in the U.S. national comorbidity survey. *Psychological Medicine*, 27, 1101–1119. doi:10.1017/S0033291797005588

- Kim, J., Talbot, N. L., & Cicchetti, D. (2009). Childhood abuse and current interpersonal conflict: The role of shame. *Child Abuse & Neglect*, 33, 362–371. doi:10.1016/j.chiabu.2008.10.003
- Lewis, H. B. (1971). Shame and guilt in neurosis. *Psychoanalytic Review*, 58, 419–438.
- Mennin, D. S., Heimberg, R. G., Turk, C. L., & Fresco, D. M. (2005). Preliminary evidence for an emotion dysregulation model of generalized anxiety disorder. *Behaviour Research and Therapy*, 43, 1281–1310. doi:10.1016/j.brat.2004.08.008
- Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the penn state worry questionnaire. *Behaviour Research and Therapy*, 28, 487–495. doi:10.1016/0005-7967(90)90135-6
- Pineles, S. L., Street, A. E., & Koenen, K. C. (2006). The differential relationships of shame-proneness and guilt-proneness to psychological and somatization symptoms. *Journal of Social and Clinical Psychology*, 25, 688–704. doi:10.1521/jscp.2006.25.6.688
- Roemer, L., & Orsillo, S. M. (2002). Expanding our conceptualization of and treatment for generalized anxiety disorder: Integrating mindfulness/acceptance-based approaches with existing cognitive-behavioral models. *Clinical Psychology: Science and Practice*, 9, 54–68. doi:10.1093/clipsy/9.1.54
- Schoenleber, M., Chow, P. I., & Berenbaum, H. (2014). Self-conscious emotions in worry and generalized anxiety disorder. *British Journal of Clinical Psychology*, 53, 299–314. doi:10.1111/bjc.12047
- Soenke, M., Hahn, K. S., Tull, M. T., & Gratz, K. L. (2010). Exploring the relationship between childhood abuse and analogue generalized anxiety disorder: The mediating role of emotion dysregulation. *Cognitive Therapy and Research*, 34, 401–412. doi:10.1007/s10608-009-9264-8
- Spitzer, R. L., Kroenke, K., Williams, J.B.W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166, 1092–1097. doi:10.1001/archinte.166.10.1092
- Stuewig, J., & McCloskey, L. A. (2005). The relation of child maltreatment to shame and guilt among adolescents: Psychological routes to depression and delinquency. *Child Maltreatment*, 10, 324–336. doi:10.1177/1077559505279308
- Tangney, J. P., & Dearing, R. L. (2002). *Shame and guilt*. New York: Guilford.
- Tangney, J. P., Wagner, P., & Gramzow, R. (1992). Proneness to shame, proneness to guilt, and psychopathology. *Journal of Abnormal Psychology*, 101, 469–478. doi:10.1037/0021-843X.101.3.469