# Grief and Solidarity Reactions I Week After an On-Campus Shooting

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#### Abstract

The impact of interpersonal violence extends beyond the victims and perpetrator(s). The purpose of this research was threefold: (a) to identify whether college students' very early reactions to an on-campus shooting were associated with well-known predictors of distress, (b) to examine whether grief and distress reactions were distinguishable in the early days following a shooting, and (c) to investigate whether a compassionate selfidentity was uniquely associated with grief but not distress. Beginning just 3 days after an early morning shooting that killed one student and injured three others, university students (N = 408) completed an online questionnaire. Grief, but not distress, was associated with a sense of solidarity with other students and a compassionate self-identity. General distress was associated with prior mental health difficulties and exposure to the shooting. Acute stress was positively associated with being female, having prior mental health difficulties, media exposure, perceived similarity to victims, less victim blame, social support, and social strain. Results suggest that grief reactions that arise in the early days following a collective loss may serve as important psychosocial resources in coping with interpersonal violence.

## Keywords

community violence, media and violence, violence exposure

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Heidi A. Wayment, Department of Psychological Sciences, Northern Arizona University, P.O. Box 15106, Flagstaff, AZ 86011, USA. Email: heidi.wayment@nau.edu On October 9, 2015, following an argument between fraternity members, four students at Northern Arizona University (NAU) were shot by a fellow student at 1:20 a.m., killing one and leaving three injured and hospitalized. News of the shooting came from middle-of-the-night campus alerts, text messages, and local and national media outlets. News reports included details about the victims, accounts of suffering (Hawdon, Agnich, & Ryan, 2014; Vaserman, Yzermans, & Dirkzwager, 2005), and examples of the social sharing of grief, social solidarity, and empathy (Gortner & Pennebaker, 2003; Hawdon et al., 2014). For example, the candlelight vigil that took place the evening of the shooting was featured on the front page of the local paper. Three days later, photos of students engaged in a solidarity walk across the campus were also featured. The outpouring of collective grief, including popup memorials and social media postings, was consistent with evidence in the literature that (a) unexpected tragedies, including types of interpersonal violence, challenge individuals' beliefs about the world as a safe and predictable place (Janoff-Bulman, 1992), and (b) feelings of solidarity, empathy, grief, and support are believed to be those best able to help facilitate recovery and prompt finding a sense of meaning from these unexpected and tragic events (Gortner & Pennebaker, 2003; Mancini, Littleton, & Grills, 2016; Pennebaker & Harber, 1993; Peterson & Silver, 2017; Rimé, 2009; Schulz et al., 2016; Updegraff, Silver, & Holman, 2008).

In our estimation, grief in the context of collective traumas is underresearched. In spite of their potential importance, indices of solidarity and grief reactions are rarely measured after communities experience losses that are the result of interpersonal violence. Instead, nearly all studies that have examined affective reactions to a variety of collective tragedies have measured two primary reactions: general distress, such as depression, anxiety, and somatic complaints, and acute or posttraumatic stress symptoms, such as event-specific intrusive and avoidant thoughts (Bonanno, Galea, Bucciarelli, & Vlahov, 2006; Norris et al., 2002; Rubonis & Bickman, 1991 Schuster et al., 2001; Silver et al., 2002). Well-established correlates of both general distress and acute stress include being female, having lower income, prior mental health difficulties, prior exposure to stressful events, experiencing social strain or the absence of support, and the degree of exposure to the event, both directly and via the media (Andersen, Silver, Stewart, Koperwas, & Kirschbaum, 2013; Belscher, Ruzek, Bongar, & Cordova, 2012; Lowe & Galea, 2017; Norris et al., 2002).

We maintain that general distress and acute stress responses do not fully capture the range of distress reactions experienced in the context of a collective loss. Grief reactions to loss are distinct from general and acute forms of distress (Dohrenwend, Shrout, Egri, & Mendelsohn, 1980; Drapeau, Marchand, & Beaulieu-Prévost, 2012) and have unique predictors in the context of collective and perceived loss (Robinson & Fleming, 1989; Wayment, 2004; Wayment & Brookshire, 2017; Wayment & Kemeny, 2004). Moreover, grief reactions are especially likely to be associated with perceptions of similarity to, and empathy for, the victims of interpersonal violence (Hodges, Kiel, Kramer, Veach, & Villanueva, 2010; Wayment, 2004), attributions about victims' possible responsibility in the violence (Peterson & Silver, 2017; Umphrey, Sherblom, & Pocknell, 2016; Weiner, 1985), the extent social support is available following the event (Grills-Taquechel, Littleton, & Axsom, 2011; Mancini et al., 2016; Updegraff et al., 2008), and the perception that there is a shared sense of solidarity around the significance of the loss event (Haslam, Jetten, Postmes, & Haslam, 2009; Morgan, Wisneski, & Skitka, 2011). Threats posed by violence-related loss can also trigger selfprotective reactions that can inhibit grief, perceptions of similarity to the victims, empathy, support, and sense of solidarity (Wayment, Barger, Woodward Tolle, & O'Mara, 2010). Little is known about what characteristics lead some individuals to feel more affected by a "collective" loss than others (Hawdon et al., 2014). Although people sometimes maintain psychological distance from the suffering of others, the ability to identify with those less fortunate is associated with a sense of connection to others that is important to well-being (Wayment, 2004; Wayment & O'Mara, 2008). We hypothesized that tendencies toward empathic and solidarity reactions (as opposed to more defensive, self-protective reactions) in the aftermath of the on-campus shooting could be captured with a measure called quiet ego (Wayment, Bauer, & Sylaska, 2015). Quiet ego is a compassionate self-identity rooted in eudaimonic and humanistic values that reflect an ability to balance self- and other concerns (Bauer & Wayment, 2008; Wayment & Bauer, 2017), and is associated with a less egoistic and more compassionate stance toward the self and others. We expected that quiet ego would be related to grief and solidarity reactions but not general distress or acute stress following a well-publicized incident of interpersonal violence on a college campus.

## Study Goals

Given the difficulties of conducting research in the immediate aftermath of violent events, including gaining ethics approval, among other challenges, few studies have been able to assess very early reactions to campus shootings at all (Elsass, Schildkraut, & Stafford, 2016; Lowe & Galea, 2017; Silver, 2004; Spence & Lachlan, 2010). But it is important to do so, because there is evidence that individuals' memories of symptoms fade over time after a violence-related event (North, Smith, & Spitznagel, 1997). Fortuitously, we had

the opportunity to study this on-campus shooting in the early days following the fatality. We expected that in the immediate aftermath of the NAU shooting, students would report several types of distress: general distress (e.g., depression, anxiety, somatic complaints), acute stress symptoms (intrusive thoughts and avoidant thoughts), and grief. As in other studies of collective loss, we predicted that general distress would be predicted by gender (female), previous mental health difficulties, number of prior stressful events, and social strain. We expected that acute stress symptoms would be related to media exposure and perceived similarity to the victims. Grief was expected to be related to perceived similarity to the victims, less victim blame, social support, and feelings of solidarity with NAU students. Furthermore, we predicted that individual differences in quiet ego, as a measure of a compassionate self-identity, would be associated with variables that reflect less psychological distance (e.g., greater perceived similarity to the victims and solidarity), and grief, but not general distress or acute stress.

# Method

## Participants

A sample of 408 college students (85.5% female, 13.5% male) over the age of 18, who were aware of the NAU shooting, completed an anonymous online survey beginning 72 hr after the shooting. The sample included a higher proportion of females that make up the larger student body (61% female). The average age of the respondents was 19.41 years (SD = 2.10; range = 18-43), younger than the general student body (average age = 23 years). Respondents self-identified as Caucasian (n = 315, 77%), Hispanic (n = 96, 23.5%), Black (n = 24, 6%), Asian (n = 21, 5%), Pacific Islander (n = 10, 2.4%), and Native American (n = 7, <2%). Respondents could identify themselves with one or more ethnic categories (i.e., total > 408). The ethnic distribution of the sample was not significantly different from that of the general student population in 2015 (58% White, 21% Hispanic, 3% Black, 2% Asian, <1% Pacific Islander, and 3% Native American),  $\chi^2(5) = 1.77$ , p = .88.

## Procedure

We registered our study procedure and hypotheses with Open Science Framework on October 14, 2015 (Wayment, 2015), 2 days after we began on-campus data collection and before we analyzed our data (van 't Veer & Giner-Sorolla, 2016). The shooting happened early Friday morning. By Friday afternoon, the lead university Regulatory Compliance officer was contacted with a special request for an expedited review of the Institutional Review Board (IRB) application. The proposal was approved Monday morning and was available online mid-morning that same day through the university's SONA system. The 30-min survey was described as an opportunity for students to share their thoughts and feelings about the event, and included a notice that students were welcome to complete the survey after the official university week of mourning. Prior to questionnaire completion, participants read an informed consent form and only when they gave consent was the questionnaire made available. Most (84%) of the sample completed the questionnaire within the first 4 days the survey was available. The survey was left open one additional week to allow additional students (16%) the opportunity to participate. The questionnaire consisted of standardized scales and items similar to those used in prior research (Wayment, 2004).

#### Measures

Demographic and background information. We asked for information on gender, age, race/ethnicity, year in school, place of residence (on- or off-campus), and fraternity or sorority membership (yes/no; because the perpetrators and victims were fraternity members). Participants were also asked when and how they first learned of the shooting.

*Personal loss.* Respondents were asked how many of the four shooting victims they knew personally (0-4).

Degree of exposure. A three-item index of exposure to the event (cf. Grills-Taquechel et al., 2011; Orcutt, Bonanno, Hannan, & Miron, 2014) was created by combining information about whether the participant was a witness to, or was near, the shooting incident when it happened (yes/no), whether the participant had been at the venue where the shooting took place that day (yes, no, unsure), and whether participants' friends had been at the venue where the shooting took place that day (yes, no, unsure). Each "yes" answer was assigned a 1 and summed ("no" or "unsure" was assigned 0); higher scores represented greater degree of exposure.

Media exposure. We adapted a set of questions from Holman, Garfin, and Silver (2014). Students reported how many minutes, on average, they spent during the first 48 hr after the shooting "watching and/or listening to media coverage about the shooting and its aftermath." Time estimates (in minutes) were collected for social media, TV, radio, online news sites, print media, and "other." The number of minutes across each category was summed.

*Prior mental health.* One item asked respondents whether they had ever "needed help for emotional or mental health problems, such as feeling sad, blue, anxious, or nervous, before the shooting," using response options (0 = no, 1 = yes).

**Previous stressors.** Major lifetime traumatic events were assessed by asking students to briefly describe whether they had experienced "any stressful events that you believe had a significant impact on your life" prior to the date of the shooting (October 9, 2015). Next, students read, "If so, please describe the event briefly (e.g., bereavement, natural disaster, illness, etc.) and indicate how old you were at the time." Students were offered the option to list *up to* six such events. The number of stressors was reviewed, consisting primarily of bereavement experiences, and was summed (cf. Seery, Holman, & Silver, 2010).

*Perceived similarity to the victims*. Six items adapted from those used by Wayment (2004) included items such as "I don't feel that I have that much in common with those who were hurt or died in the shooting" (reversed), "The kinds of students that go to fraternity parties are not very different from me," and "It is easy for me to imagine being in a similar position as those who were victims of the shooting." Items were rated on a 5-point scale (1 = strongly disagree, 5 = strongly agree) and averaged to create a measure of perceived similarity to the shooting victims. Cronbach's alpha was .83.

Victim blame. Two items designed to measure internal attributions of control and responsibility were adapted from Bandura's (1977) 100-point scale to assess perceived control. Respondents were asked to rate how much control the shooter and victims had by assigning two percentages (one for victims, one for shooter) that totaled 100%. The same question format was used to assess responsibility for the shooting. The percentage attributed to the victims' control and responsibility was highly correlated (.84, p < .001) and was averaged to form a single measure of victim blame for the shooting (Cronbach's  $\alpha = .73$ ). Higher scores reflected greater assignment of control and responsibility for the victims.

Social support and social strain. Six items were adapted from earlier research (Lepore, Silver, Wortman, & Wayment, 1996). Items assessed supportive (e.g., "My family has been very supportive of my reactions to the shooting") and unsupportive ("My friends have given me the idea that they don't want to hear about my thoughts and feelings about the shooting") reactions. Items were rated on a 5-point scale (1 = strongly disagree; 5 = strongly agree) and

averaged to create measures of support and strain. Support and strain were negatively correlated (-.29, p < .001), and coefficient alphas were acceptable (.83, .79, respectively).

Sense of solidarity. Nine items were used to assess feelings of solidarity with other students at NAU (O'Mara, 2005). Items included "I have a great deal in common with other NAU students" and "I feel like I fit in with other NAU students." Items were rated on a 5-point scale ( $1 = strongly \ disagree$ ,  $5 = strongly \ agree$ ) and averaged to create a measure of sense of solidarity. Cronbach's alpha was .88.

*Compassionate self-identity.* Individual differences in compassionate stance toward the self and others were assessed with the Quiet Ego Scale (QES; Wayment et al., 2015), a 14-item measure reflecting a compassionate self-identity, as characterized by a balance in self- and other-focused values and growth motivation (Wayment & Bauer, 2017; Wayment et al., 2015), and has generally been described as a less defensive orientation toward the self and others (Bauer & Wayment, 2008). Items were rated on a 5-point scale (1 = strongly disagree, 5 = strongly agree) and averaged to create a measure of quiet ego characteristics. Cronbach's alpha was .80.

General distress. Depressive and general anxiety symptoms were assessed with the Patient Health Questionnaire–4 (PHQ-4; Löwe et al., 2010), and somatization was assessed with three items from the Symptom Checklist–90 (SCL-90) somatization scale (Derogatis, Rickels, & Rock, 1976). Respondents were asked to think about their feelings in the first 48 hr after the shooting. All seven items were rated on a 4-point scale (0 = not at all, 1 = several hours, 2 = about half the time, and 3 = nearly all the time). Items were summed to form a measure of general distress (range = 0-30). Cronbach's alpha was .94.

Acute stress reactions. Ten items designed to assess event-related stress symptomatology were used (T. Hopwood, personal communication, October 5-13, 2015, regarding scale items for Anticipatory Trauma Scale [*Diagnostic and Statistical Manual of Mental Disorders*, 5th ed.; *DSM-5*; American Psychiatric Association, 2013, criteria B, C, D, and E]). The items are similar to items related to intrusive thoughts, avoidance, and fear found in the Impact of Event Scale (Horowitz, Wilner, & Alvarez, 1979) and the Stanford Acute Stress Reaction Questionnaire (SASRQ; Cardeña, Koopman, Classen, Waelde, & Spiegel, 2000). Participants indicated their agreement (1 = *strongly disagree*, 5 = *strongly agree*) with statements assessing intrusive thoughts ("I felt that

the shooting incident kept popping into my mind, even when I did not want to think about it"), avoidance ("I avoided places or things that might put me at risk from this type of event"), and fear ("I had trouble sleeping due to concerns about how this type of event might affect my family or myself in the future") experienced in the first 48 hr after the shooting. Cronbach's alpha was .92.

*Grief.* Six items from the Texas Inventory of Grief (Faschingbauer, DeVaul, & Zisook, 1977) were used and adapted in ways reported in previous research (Wayment, 2004). Respondents indicated their degree of agreement with statements about grief-related reactions in the *first 48 hr* after the shooting (e.g., "I grieved when I thought of what happened"). These items were rated on a 5-point scale ( $1 = strongly \ disagree, 5 = strongly \ agree$ ) and combined to form a measure of grief reactions. Cronbach's alpha was .85.

# Results

The statistical analyses were performed with SPSS 24.0 (SPSS, Chicago, IL, USA) and included descriptive analyses (*t* tests, correlations) and multiple regression analyses using a hierarchical variable entry strategy. Prior to analysis, the data were examined for missing values. All study variables had some missing data that ranged between 0.06% and 4.4% (e.g., n = 18 missing for sense of solidarity). We used mean replacement in SPSS to replace missing values.

Table 1 present descriptive data by gender. Nineteen percent of the sample reported knowing one or more of the shooting victims (n = 77), 12% of the sample (n = 49) knew one victim, 2.9% (n = 12) knew two, 1.5% (n = 6) knew three, and 2.5% (n = 10) knew all four victims. The degree of exposure variable ranged from 0 (no exposure) to 3. About one quarter of the sample reported no exposure (25.7%, n = 105), 52.5% (n = 214) had a score of 1 (low exposure), and 21.8% (n = 89) reported moderate to high exposure (score 2 or 3). In the first 48 hr after the shooting, participants reported spending between 3 and 4 hr learning about the shooting via social media or traditional news media.

Average grief and acute stress scores were above the scale midpoint and general distress scores were below the scale midpoint. Distress measures were moderately correlated (grief and general distress, r = .43; grief and acute stress, r = .46; acute stress and general distress, r = .61; all ps < .001). General distress and grief were only very modestly correlated, r = .15, p < .003, after controlling for acute stress. Average levels of perceived similarity to the victims, social support, sense of solidarity, and quiet ego were above the scale midpoint. Average levels of social strain and victim blame were

|                                   | Femi    | ales | Mal          | es   |           | Kno  | wa   | Did Not        | Know <sup>a</sup> |           |
|-----------------------------------|---------|------|--------------|------|-----------|------|------|----------------|-------------------|-----------|
|                                   | (n = n) | 353) | = <i>u</i> ) | 55)  |           | = u) | (77) | ( <i>n</i> = 3 | 31)               |           |
| Study Variables                   | ξ       | S    | £            | SD   | F         | ξ    | SD   | ¥              | SD                | ч         |
| Days since shooting <sup>b</sup>  | 5.01    | 2.48 | 5.37         | 2.79 | 1.82      | 4.91 | 2.43 | 5.03           | 2.54              | 0.08      |
| Personal loss                     | 0.33    | 0.82 | 0.27         | 0.76 | 0.22      | 1.72 | 1.09 |                | I                 |           |
| Degree of exposure <sup>c</sup>   | 1.05    | 0.82 | 0.84         | 0.83 | 3.44      | 1.47 | 0.82 | 0.92           | 0.79              | 29.19***  |
| Media exposure <sup>d</sup>       | 3.49    | 6.0  | 1.72         | 2.13 | 4.80*     | 3.79 | 3.63 | 3.12           | 6.04              | 0.99      |
| Mental health <sup>e</sup>        | 0.50    |      | 09.0         |      |           | 0.55 |      | 0.50           |                   | 1.96      |
| Previous stressors                | 1.82    | I.63 | I.63         | I.54 | 0.71      | 1.54 | I.49 | 1.93           | 1.62              | 3.10      |
| Perceived similarity <sup>f</sup> | 3.27    | 0.84 | 3.01         | 0.92 | 6.6**     | 3.84 | 0.80 | 3.13           | 0.82              | 48.10***  |
| Victim blame <sup>g</sup>         | 0.18    | 0.19 | 0.23         | 0.23 | 3.30      | 0.11 | 0.14 | 0.20           | 0.20              | 13.9***   |
| Social support <sup>f</sup>       | 4.33    | 0.63 | 3.92         | 0.70 | 14.3***   | 4.28 | 09.0 | 4.20           | 0.66              | 2.11      |
| Social strain <sup>f</sup>        | 1.72    | 0.81 | 1.93         | 0.81 | 2.5       | 1.69 | 0.80 | I.68           | 0.92              | 0.05      |
| Sense of solidarity <sup>f</sup>  | 3.91    | 0.65 | 3.61         | 0.76 | 14.9***   | 4.22 | 0.66 | 3.84           | 0.66              | 19.7***   |
| Quiet ego <sup>f</sup>            | 3.84    | 0.48 | 3.77         | 0.37 | 0.14      | 3.83 | 0.46 | 3.79           | 0.46              | 0.87      |
| General distress <sup>h</sup>     | 7.65    | 7.41 | 3.91         | 0.65 | 12.3***   | 11.3 | 9.5  | 6.21           | 6.52              | 31.9***   |
| Acute stress <sup>f</sup>         | 3.31    | 0.89 | 2.48         | 1.03 | 31.6***   | 3.5  | 0.85 | 3.09           | 0.94              | 9.3   *** |
| Grief                             | 4.28    | 0.70 | 3.52         | 0.99 | 60.   *** | 4.6  | 0.52 | 4.12           | 0.82              | 19.3***   |
|                                   |         |      |              |      |           |      |      |                |                   |           |

**Table 1.** Description of Study Variables by Gender and Knowledge of Victims (N = 408).

<sup>a</sup>There were no gender differences in sample who knew one or more victims (88% female) compared with those who did not (86% female,  $\chi^2 = 0.26$ , *ns*). <sup>b</sup>Number of days after shooting.

℃Out of maximum of 3.

dIn first 48 hr after shooting.

e% of yes answers.

<sup>f</sup>5-point scale.

<sup>g</sup>Out of 100%.

h0-30 point scale. \*p < .05. \*\*p < .01. \*\*\*p < .001.

lower than the scale midpoint. Time since the shooting was only very modestly associated with less acute stress, r = -.09, p = .067, and unrelated to grief, r = -.03, p = .611, or general distress, r = .03, p = .567. Zero-order correlations are presented in Table 2 for those who knew and did not know one or more of the victims.

#### Predictors of Grief, General Distress, and Acute Stress

We predicted that general distress would be predicted by gender (female), previous mental health difficulties, number of prior stressful events, and social strain; that acute stress would be predicted by media exposure and perceived similarity to the victims; and that grief would be predicted by perceived similarity to the victims, less victim blame, social support, and feelings of solidarity with NAU students. Furthermore, we predicted that quiet ego would be associated with grief but not general distress or acute stress. Regression models using a hierarchical variable entry strategy were used to test these predictions. Seven steps were included in each analysis. The first two steps included demographic variables (age, gender) and personal loss (number of victims known). Next, exposure experiences (degree of exposure, media exposure) and previous stressors (prior mental health difficulties, previous stressors) were added. The last three steps included social-psychological factors (perceived similarity, victim blame), social factors (social support, social strain), and followed by a step that included sense of solidarity and quiet ego. Zeroorder correlations confirmed that all variables listed above (except previous stressors) should be included in the preliminary regression analyses.

To maximize differentiation between the three distress outcomes, models for general distress and grief initially controlled for acute stress in Step 1. Table 3 presents a summary of the final model results. Our predictions were largely supported. General distress was associated with acute stress, personal loss, prior mental health, degree of exposure, and media exposure. Acute stress was associated with being female, media exposure, perceived similarity to victims, less victim blame, social support, and social strain. Grief was related to being female, perceived similarity to victims, less victim blame, social support, less social strain, sense of solidarity, and quiet ego. The total variance accounted for by each regression ( $R^2$ ) was converted to Cohen's  $f^2$ effect sizes and was determined to be large (range = 0.39-1.33).

## Discussion

The present study captured a very early snapshot of students' reactions to an on-campus shooting that became the intense focus of a university

| Victin             | IS.                     |                        |                         |                       |                               |                     |           |                      |                |        |                |             |              |                  |               |                 |
|--------------------|-------------------------|------------------------|-------------------------|-----------------------|-------------------------------|---------------------|-----------|----------------------|----------------|--------|----------------|-------------|--------------|------------------|---------------|-----------------|
|                    | _                       | 2                      | m                       | 4                     | ß                             | 6                   | 7         | 8                    | 6              | 01     | =              | 12          | 13           | 4                | 15            | 16              |
| _                  |                         | 80.                    | 90.                     | .02                   | 06                            | 08                  | 00        | .03                  | ō.             | 04     | <u>.</u>       | .05         | 10           | 04               | 0 .<br>       | 03              |
| 7                  | 01                      |                        | 01.                     | - 10                  | 09                            | 05                  | .02       | Ξ.                   | .05            | 17     | 90.            | 16          | 00.          | 17               | 26            | 36              |
| m                  | .40                     | .20                    |                         | 04                    | 02                            | .12                 | .05       | 07                   | .05            | - 19   | .08            | - I0        | сI.          | <br> 4           | 12            | 07              |
| 4                  | .05                     | 06                     | .I5                     |                       | .I6                           | .07                 | .04       | 61.                  | ю <sup>.</sup> | 10     | 0 <u>.</u>     | <u>+</u>    | .03          | .28              | <u>.</u><br>4 | 60 <sup>.</sup> |
| ъ                  | 02                      | 26                     | 05                      | .30                   |                               | 01.                 | 05        | Ы.                   | 05             | 8I.    | 05             | .15         | 00.          | .35              | .24           | 61.             |
| 9                  | 10                      | 16                     | 04                      | .20                   | 14                            |                     | .20       | 01                   | 06             | 09     | ю <sup>.</sup> | 05          | 10.          | 61.              | 01.           | <u>0</u>        |
| 7                  | 24                      | 06                     | 10.                     | .24                   | Ξ.                            | 61.                 |           | .08                  | .02            | 10     | 09             | .07         | .03          | .05              | .04           | <u>.</u>        |
| œ                  | .02                     | 21                     | 10.–                    | .25                   | 60 <sup>.</sup>               | 90.                 | .23       |                      | 17             | .26    | .02            | .48         | .23          | .34              | .37           | 44.             |
| 6                  | 02                      | .36                    | .20                     | .07                   | .05                           | 15                  | 10.–      | 33                   |                | 16     |                | 20          |              | <u> </u> 4       | 24            | 27              |
| 0                  | 00.–                    | 28                     | 03                      | .29                   | :<br>Н                        | 04                  | 60.       | .12                  | Ξ.             |        | 25             | .44         | .24          | .21              | .35           | .46             |
| =                  | 28                      | .I5                    | 03                      | Ē                     | 15                            | .25                 | 04        | 12                   | 80.            | 41     |                | 07          | <del>8</del> | 00               | 03            | 16              |
| 12                 | 01                      | 27                     | - 10                    | Ξ.                    | .04                           | 01.                 | .02       | .29                  | Ē              | .25    | 12             |             | .26          | Г.               | .34           | .54             |
| <u>~</u>           | .05                     | <u> </u>               | .I6                     | .02                   | 06                            | 07                  | .04       | <u>с</u> І.          | - 10           | 01.    | <br>13         | .27         |              | .07              | .07           | .30             |
| 4                  | .27                     | 20                     | <u>.</u>                | 14                    | .34                           | <u>8</u> .          | 03        | .15                  | 90.            | .32    | .02            | <u>8</u> I. | Ξ.           |                  | .62           | .42             |
| 15                 | 04                      | 30                     | 07                      | 60 <sup>.</sup>       | .25                           | .16                 | .03       | .07                  | 02             | .33    | .24            | 61.         | .I5          | .57              |               | .60             |
| 16                 | 04                      | 43                     | - 13                    | .32                   | .26                           | .29                 | .05       | .24                  | 21             | .40    | -<br>4         | .45         | .22          | 4.               | .47           |                 |
| Note. L<br>(n = 77 | .ower left<br>'), <15 c | (n = 77)<br>sr >.15 (i | , upper r.<br>1 = 331); | ight $(n = p < .001)$ | 331). ρ <<br>when <i>r</i> is | .05 wher<br>s <34 o | r >.34 (n | 23 or >.2<br>= 331). | 3 (n = 77      | ), <11 | or >.11 (      | n = 331);   | v 10. > d    | vhen <i>r</i> is | <32 or        | >.32            |

**Table 2.** Intercorrelations Among Study Variables for Students Who Knew (n = 77) and Did Not Know (n = 331) One or More

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|                                    | Gene  | ral Dis | tress  | Ac    | ute Str | ess    |       | Grief  |        |  |  |
|------------------------------------|-------|---------|--------|-------|---------|--------|-------|--------|--------|--|--|
| Study Variables                    | В     | SE      | β      | В     | SE      | β      | В     | SE     | β      |  |  |
| Constant                           | -9.22 | .98     |        | 1.09  | 2.86    |        | 1.09  | .31    |        |  |  |
| Control: Acute stress              | 4.05  | .30     | .51*** |       |         |        | 0.30  | .03    | .36*** |  |  |
| Gender (female)                    |       |         |        | -0.47 | .12     | 17***  | -0.39 | .08    | 17***  |  |  |
| Personal loss                      | 1.47  | .35     | .16*** |       |         |        |       |        |        |  |  |
| Degree of exposure                 | 1.04  | .22     | .18*** |       |         |        |       |        |        |  |  |
| Media exposure                     | 0.20  | .05     | .15*** | 0.02  | .01     | .14**  |       |        |        |  |  |
| Prior mental health                | 1.38  | .54     | .09**  | 0.16  | .08     | .08*   |       |        |        |  |  |
| Perceived similarity<br>to victims |       |         |        | 0.23  | .05     | .21*** | 0.10  | .04    | .11**  |  |  |
| Victim blame                       |       |         |        | -0.01 | .00     | 13**   | -0.00 | .00    | 08**   |  |  |
| Social support                     |       |         |        | 0.38  | .07     | .26*** | 0.13  | .05    | .11*** |  |  |
| Social strain                      |       |         |        | 0.13  | .05     | .12**  | -0.07 | .03    | 07*    |  |  |
| Sense of solidarity                |       |         |        |       |         |        | 0.28  | .05    | .24*** |  |  |
| Quiet ego                          |       |         |        |       |         |        | 0.21  | .06    | .12**  |  |  |
| Final Model df                     |       | 5,402   |        |       | 7,400   | )      |       | 8,399  | )      |  |  |
| Final Model F                      | 77    | ′.20*** |        | 2     | 3.27**  | *      | 6     | 7.35** | *      |  |  |
| Adjusted R <sup>2</sup>            |       | 48%     |        |       | 28%     |        |       | 57%    |        |  |  |
| Cohen's f <sup>2</sup>             | C     | .92     |        |       | 0.39    |        |       | 1.33   |        |  |  |

| Table 3  | Regr  | ression | Results | for F | redictors | of | General | Distress, | Acute | Stress, | and |
|----------|-------|---------|---------|-------|-----------|----|---------|-----------|-------|---------|-----|
| Grief (N | = 408 | ).      |         |       |           |    |         |           |       |         |     |

Note. The initial regression model included 14 variables (across seven steps), followed by a final model that included only those variables that remained significant. To maximize differentiation between the three outcomes, models for general distress and grief controlled for acute stress at Step 1. Two variables were not related to any outcome and not listed in this table: Age and previous stressors. According to Cohen's (1988) guidelines,  $f^2 \ge 0.35$  represents a large effect size.

p < .05. p < .01. p < .001.

community. Data collection began 72 hr after the shooting and adds to the literature on reactions to interpersonal violence by providing valuable information about the earliest reactions to such experiences (Elsass et al., 2016). Our results suggest that in the early days after a shooting that affected a campus community, grief was an important affective reaction. Although captured in the popular media immediately after such tragedies occur (Gortner & Pennebaker, 2003; Hawdon et al., 2014), it is rarely assessed in empirical studies of collective loss. Grief, but not distress, was associated with empathic, supportive, and collective reactions that are important for coping with unexpected tragedy.

Our results also highlight that grief and distress reactions are distinguishable responses to collective loss. Even in the immediate aftermath of an event such as a school shooting, we found that grief reactions were associated with collective meaning-making that is so vital for coping. In contrast, and in line with existing research regarding predictors of distress reactions to collective loss, we found that general distress reactions were associated with background and exposure factors, such as the number of victims known and degree of media exposure, as well as previous mental health difficulties. Acute stress reactions (e.g., intrusive and avoidant thoughts and fears) were higher among female students and were associated with media exposure, social strain, and feeling similar to the victims. Grief and acute stress reactions were both associated with placing less blame on the victims of the shooting, a finding that underscores the importance of the ability to have empathy for victims (Peterson & Silver, 2017; Umphrey et al., 2016) and highlights the role that empathy might also play in understanding the behavior of the perpetrator (see Peterson & Silver, 2017).

Taken together, our results contribute to the literature in three ways. First, we examined affective reactions within days of the shooting and not months later as is typically the case (Lowe & Galea, 2017). Second, we found that grief, and not distress, was associated with collective and supportive reactions, supporting the idea that grief is a reaction in response to others' suffering, whereas distress may be a more self-focused reaction to loss (Wayment, 2004). Third, we found that a compassionate self-identity, or quiet ego, may have helped students experience the benefits associated with collective grief and solidarity (Bryant & Smith, 2015; Gelkopf, Berger, Bleich, & Silver, 2012; Mancini et al., 2016; Poulin, Silver, Gil-Rivas-V Holman, & McIntosh, 2009). As predicted, quiet ego characteristics were uniquely related to grief reactions and its correlates, including perceived similarity, less victim blaming, social support, and solidarity. However, our results also indicate that in the early days after the shooting, social support was associated with greater acute stress, consistent with studies describing the paradoxical effects of social support following a collective loss (Rimé, Páez, Basabe, & Martínez, 2010). The presence of acute stress may be important to the socially shared meaning that ultimately allows individuals to find meaning and experience social integration (Rimé et al., 2010; Updegraff et al., 2008).

#### Limitations

Despite our ability to get into the field quickly to add to the very small body of literature on early responses to violence that affects communities, there are several limitations to our study.

First, our sample was mostly White and although the ethnic variability in our sample reflected the larger NAU student body, it was majority female and younger, and it may not represent other collegiate populations. Furthermore, our sample consisted of student volunteers who may have been seeking an outlet to express their feelings following the tragedy. We also had a relatively small sample of male students, perhaps a reflection of gender differences in emotional disclosure and willingness to participate in the study (McIntyre, Spence, & Lachlan, 2011). We sampled college students after an event that, although shocking to members of the university town in rural northern Arizona, was relatively small in scope compared with other high-profile mass shootings. Thus, our findings may not be generalizable to reactions of more ethnically diverse populations or reactions to other types of collective violence. We also acknowledge the limitations of our correlational design, which precluded our ability to make causal inferences. Of course, prospective studies that allow for longer term follow-up would be valuable, as health effects from collective traumas may show up several years later (Silver et al., 2013). There are also limitations regarding our measures. For example, our item of victim blame assessed two basic attributions (control, responsibility) with just two items. There are other blame inventories available such as the 42-item Gudjonsson Blame Attribution Inventory-Revised (Gudjonsson & Singh, 1989) and the 24-item Attribution of Blame Scale (Loza & Clements, 1991). Another limitation concerns our measure of acute stress. Although the items we used were similar to those found in reliable and commonly used scales to assess acute stress reactions, future studies would benefit from using scales whose scores can be compared with other published studies (e.g., R. A. Bryant, 2016; Cardeña et al., 2000).

# Conclusion

Studies that have examined reactions to collective loss have typically assessed only general and acute forms of distress and have measured these reactions weeks or months following the event (see Lowe & Galea, 2017, for a review). Our data support what other researchers have argued: that adjustment to tragedies that challenge "assumptive worlds" and trigger a search for meaning may be assisted by empathic reactions, and that such reactions may be aided by a sense of perceived similarity to those affected, social support, and community solidarity (Mancini et al., 2016; Mash, Ursano, Benevides, & Fullerton, 2016). Our findings also add to the literature by demonstrating that a compassionate self-identity may facilitate such reactions. In turn, collective and supportive reactions to tragic experiences can strengthen a compassionate self-identity, an identity that has been shown in previous research to be associated with well-being and resilience (Wayment & Bauer, 2017; Wayment et al., 2015).

## Clinical and Policy Implications

Our results examine the extent to which a well-publicized act of violence on a few college students also impacted the university and local communities. Practical application of our findings includes recommendations that the media can help communities realize the importance of their coming together to grieve and support each other in ways that inspire a collective sense of similarity with, and empathy for, those most affected by violence. This type of collective discourse helps facilitate the socially supportive responses that may aid the recovery process (Hawdon et al., 2014; Peterson & Silver, 2017; Schulz et al., 2016; Updegraff et al., 2008). Understanding the types of affective reactions experienced in the immediate aftermath of a campus shooting is important because it can help target interventions to those who may be most in need. Another important practical application of our results concerns how university counselors and other professionals might help students cope with these kinds of tragedies. Understanding that grief reactions are present in the early days after a collective loss and, unlike feelings of depression, anxiety, or fear, may be associated with feelings of community connectedness, solidarity, and compassion can inform not only future intervention efforts but also provide insight into the psychosocial mechanisms of growth and resilience for those affected by violence.

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