

## Perfectionism and causal attributions: An experience sampling approach

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Harper, K. L., Eddington, K. M., & Silvia, P. J. (2020). Perfectionism and causal attributions: an experience sampling approach. *Journal of Research in Personality*, 87. DOI: 10.1016/j.jrp.2020.103978

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### **Abstract:**

The primary aim of the study was to examine whether dimensions of perfectionism—socially prescribed perfectionism (SPP) and self-oriented perfectionism (SOP)—were related to causal attributions, and to what extent event-specific attributions about social interactions were related to mood. Experience sampling methodology was used to examine event-specific attributions about negative social interactions and mood in daily life. SPP and SOP had different relationships with trait attributional styles. Although neither SPP nor SOP were related to event-specific attributions, SOP moderated the covariation of negative attributions and sadness: higher scores on SOP were associated with a stronger relation between negative attributions and sadness. Additionally, SPP was positively related to the proportion of negative social interactions.

**Keywords:** Socially prescribed perfectionism | self-oriented perfectionism | causal attributions | experience sampling methodology

### **Article:**

Perfectionism, a multi-dimensional personality construct (Hewitt & Flett, 1991), influences people's mood, cognitions, and behavior in daily life. One common distinction made between dimensions of perfectionism is the source perfectionistic standards are attributed to (Hewitt & Flett, 1991). Self-oriented perfectionism (SOP) is a dimension of perfectionism that involves striving for perfectionistic standards that are internal and from oneself. Socially prescribed perfectionism (SPP), in contrast, is a dimension of perfectionism involving perfectionistic standards introjected from others and feeling as if one cannot live up to others' standards.

The distinction between these dimensions of perfectionism is important as SPP and SOP are often differently related to emotional outcomes, including in daily life. SPP is consistently associated with higher daily negative affect (Harper et al., 2019, Mushquash and Sherry, 2012, Sherry and Hall, 2009, Sherry et al., 2014) while research on SOP and daily affect has resulted in mixed findings. One study showed no relationship between SOP and daily affect (Sherry & Hall,

2009); another found that people high on SOP had higher levels of daily sadness (Harper et al., 2019). Previous research suggests that emotional outcomes related to SPP and SOP may be due to contextual factors (Hewitt & Flett, 1993); therefore, examining contextual factors and how they may influence cognitions, behaviors, and mood in a naturalistic environment may be beneficial for understanding perfectionists' emotional functioning.

Causal attributions, a person's interpretation of the reason for why an experience or outcome occurred (e.g., failing or succeeding; Heider, 1958), are a cognitive process that may influence perfectionists' emotional experiences. Negative causal attributions—the tendency to make internal (e.g., blames oneself as opposed to external factors), global (e.g., generalized to all domains), and stable attributions (e.g., the problem will continue over time)—are associated with depression (Abramson, Metalsky, & Alloy, 1989). The association between perfectionism and causal attributions differs depending on how attributions are measured. For example, one study that measured trait attributional styles found that SPP was positively related to a negative attributional style (i.e., attributing negative outcomes to internal, global, and stable causes; Chang & Sanna, 2001). However, another study that measured event-specific causal attributions (i.e., attributions about performance on an academic test) found that SPP was associated with both internal and external causal attributions for negative outcomes (Blankstein & Winkworth, 2004). Blankstein and Winkworth (2004) did not measure global or stable attributions.

SOP has a similar pattern of associations with causal attributions. When causal attributions were measured at the trait level, SOP was associated with a negative attributional style (Chang & Sanna, 2001). However, when examining event-specific attributions, SOP was associated with both internal and external attributions for negative outcomes (i.e., academic problems; Blankstein & Winkworth, 2004). Although Blankstein and Winkworth (2004) is the only study to date that examined SOP and event-specific attributions, several studies have examined how a related perfectionism construct, perfectionistic striving, relates to event-specific attributions. Perfectionistic striving is a latent variable comprised of several measures of perfectionism, including SOP, that measures internal, perfectionistic striving. Research on perfectionistic striving suggests it is associated with external attributions for negative outcomes (Levine et al., 2017, Stoeber and Becker, 2008; Barge-Schaapvel et al., 1999). In sum, the limited amount of research on SPP, SOP, and attributions suggests that there are different associations with trait attributional styles and event-specific attributions. However, more research on the relationship between these dimensions of perfectionism and attributional styles is needed.

Additionally, more research on the impact of attributions on the relation between perfectionism and mood is needed. Research suggests that both trait attributional styles and event-specific attributions can impact mood (Hankin, Fraley, & Abela, 2005). However, research on the moderating role of attributions in the relation between perfectionism and mood is limited. A study on trait attributional style found perfectionists (both SPP and SOP) who had a negative attributional style had higher depressive symptoms (Chang & Sanna, 2001). At the situation-specific level, attributions (internal or external) did not moderate the relation between perfectionism and depressive symptoms (Blankstein & Winkworth, 2004). However, this study on event-specific attributions only focused on exam performance, and not other types of negative events, such as social events. Social events may be especially relevant for perfectionists because feeling disconnected from others is one mechanism that explains greater negative emotional outcomes (Hewitt, Flett, Sherry, & Caelian, 2006). SPP, but not SOP, is positively associated with perceived negative social interactions (Nepon, Flett, Hewitt, & Molnar, 2011). Negative social interactions partially mediated the relation between perfectionism and depression concurrently (Nepon et al.,

2011) and longitudinally (Dunkley, Sanislow, Grilo, & McGlashan, 2006). To our knowledge, no study has examined causal attributions for negative social events in relation to perfectionism, which may provide further insight into how these interactions impact mood in perfectionists.

The primary aim of the current study was to examine whether SPP and SOP predicted causal attributions about negative social interactions, and to what extent attributions explained variations in mood. To capture real-world, negative social interactions, the study used experience sampling methodology (ESM) where participants reported whether they had a negative social interaction, and if so, reported on the causal attributions for the event three times a day for a week. Trait attributional styles were also measured to further understand how different dimensions of perfectionism are related to both trait and event-specific attributions.

Based on previous findings (Chang & Sanna, 2001), it was expected that SPP and SOP would be positively associated with a negative trait attributional style. Although research on SPP and event-specific attributions is mixed, research suggests that people high on SPP are more likely to engage in self-blame (Stoeber & Janssen, 2011), which may capture the internality aspect of negative attributions. Therefore, at the event-specific level it was expected that people high on SPP would have higher negative attributions (internal, global, and stable). Because people high on perfectionistic strivings tend to attribute failures externally (Levine et al., 2017, Stoeber and Becker, 2008), it was expected that SOP would be associated with lower levels of negative attributions about negative social interactions. Regarding the association with mood, it was expected that negative attributions about negative social interactions would be positively associated with negative affect and negatively associated with positive affect (Hankin, Fraley, & Abela, 2005). Lastly, similar to the moderating role of trait attributional styles in the relationship between perfectionism and depressive symptoms (Chang & Sanna, 2001), it was expected that for people high on perfectionism (SPP and SOP), the relation between negative attributions and negative affect would be stronger than for people low on perfectionism.

A secondary aim of the study was to better understand perfectionists' daily social functioning. In addition to measuring attributions about negative social events, the current study also examined how the two dimensions of perfectionism were related to the number of negative social interactions reported. Based on previous research linking SPP with negative social interactions (Nepon et al., 2011), it was expected that SPP would be positively associated with the proportion of negative social interactions. SOP was not expected to be associated with negative social interactions (Nepon et al., 2011). The design of the current study also allowed for exploratory analyses examining possible reasons for having no social interaction, such as a lack of opportunity, preferring to be alone, perceiving that others did not want to interact with them, and avoidance. Similar reasons for lack of social contact have been examined related to depression (Brown et al., 2007, Brown et al., 2011) and social anhedonia (Kwapil et al., 2009). However, to our knowledge, this is the first study to examine reasons for no social contact related to perfectionism.

## **1. Method**

### *1.1. Participants*

Participants (N = 160) were undergraduate students from the University of North Carolina at Greensboro who received partial course credit or extra credit for their participation (depending on the semester they participated). Participants were oversampled for high scores on the SPP subscale

of the Multidimensional Perfectionism Scale (score of 62 or higher; MPS; Hewitt & Flett, 1991) to ensure representation of high scores. Specifically, students receiving partial course credit for participation in research studies in the Psychology Department at University of North Carolina at Greensboro completed a battery of self-report measures, including the MPS, in the beginning of the semester. If students scored 62 or higher on the SPP subscale of the MPS, we contacted them via telephone and email to offer participation in this study. We recruited people who were high on SPP until approximately 25% of the targeted recruitment sample had scores higher than 62 (i.e., approximately one month). We then allowed any students receiving partial course credit to participate in the study. From this sample, 2 people were excluded for selecting Pacific Standard Time (rather than Eastern Standard Time) when registering for the ESM surveys, 2 people were excluded because they completed 0 ESM surveys, and 5 people were excluded due to elevated scores on a measure of inconsistent responding. See Measures section below for additional information on the inconsistent responding measure. The sample size was based on convenience; however, it is comparable to the median sample sizes in recent ESM studies (i.e., 159 participants; Hofmann & Patel, 2015). Additionally, our current study had a larger within-person sample size (i.e., number of surveys) than a previous study examining the association between event-specific attributions and mood (Hankin et al., 2005).

Participants (N = 151) included in the analyses predominantly identified as female (72%) and 1% declined to state their gender. Participants had a mean age of 20.1 (SD = 5.48) and identified as racially/ethnically diverse (32.9% identified as African-American, 7.9% as Asian, 15.2% as Hispanic/Latino, 1.3% as Middle Eastern/Arab, <1% as Pacific Islander, 46% as White, and 2.0% as “other”). Participants could select more than one racial/ethnic identity.

## *1.2. Individual differences measures*

### *1.2.1. Perfectionism*

The Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991) was used to assess trait levels of the dimensions of perfectionism of interest (SPP and SOP). The MPS has three subscales—SPP, SOP, and other-oriented perfectionism (OOP). OOP was not included in analyses as there were no specific hypotheses derived regarding this subscale. The subscales had good internal consistency in the current sample (SPP  $\alpha = 0.88$ ; SOP  $\alpha = 0.87$ ).

### *1.2.2. Trait attributional style*

Trait attributional style was measured with the Attributional Style Questionnaire (ASQ; Peterson et al., 1982). The ASQ measures dispositional attributional styles using attributions about 12 scenarios (6 “good” and 6 “bad” scenarios with both interpersonal and achievement scenarios). Participants were instructed to read the scenario, think of one major cause for the situation, and provide that cause as an open-ended response. Then participants were asked to rate the cause for the situation using 4 response items that were rated on a 7-point scale. Three of the response items captured whether the cause was internal, stable, and global. The fourth response item captured the importance of the scenario to the participant. Items assessing internality, stability, and globality were combined into two subscales, one for good situations and one for bad situations. These subscales were called ASQ Positive and ASQ Negative, respectively. Higher scores on ASQ Positive suggest an adaptive attributional style for positive events. Higher scores on ASQ Negative,

in contrast, suggest a maladaptive attributional style for negative events. The subscales had adequate internal consistency in the current sample (ASQ Negative  $\alpha = 0.80$ ; ASQ Positive  $\alpha = 0.85$ ).

### *1.2.3. Response inconsistency*

Five sets of item pairs (10 items total) were used to measure inconsistent responding. Responses were rated on a 5-point scale ranging from 1 (not true at all) to 5 (very true). The difference scores for the paired items were summed for a total inconsistency score. A cutoff score of 7 was used (Maniaci & Rogge, 2014). Five people were excluded from analyses because they had scores of 7 or greater.

## *1.3. ESM items*

### *1.3.1. Negative Social Interactions, Event-Specific Attributions, and Reasons for No Social Contact*

Participants were asked whether they had interacted with anyone in the past three hours. If they responded yes, then they were asked “were any of those interactions negative (e.g., someone got mad at me, I got annoyed with someone, I felt rejected, criticized, ignored, left out, someone didn’t answer my text, etc.)?”, coded no = 0, yes = 1. For analyses, a variable representing frequency of negative social interactions was created by calculating a proportion—total number of negative social interactions reported divided by the total number of surveys completed—for each person.

If participants responded that they had a negative social interaction, they were asked about their attributions about the most negative event. The 4 response items from the ASQ (Peterson et al., 1982) were used to assess attributions about daily social events. Items assessed the importance of each event and whether the participant perceived the cause of the event as stable, internal, and global (on a 7-point scale). A composite of the three items (stability, internality, and globality) was created by taking the mean of the item scores. Multilevel confirmatory factor analysis (MCFA) was used to examine the reliability of the three-item scale assessing attributions (Bolger and Laurenceau, 2014). Results indicate that the items were reliable for examining between-person variation across time ( $\omega = 0.706$ ).

If participants responded that they had not had a social interaction in the past 3 h, they were asked to respond to 4 items about why they had not interacted with someone. These items were selected based on previous ESM studies (Brown et al., 2007, Brown et al., 2011, Kwapil et al., 2009). Participants were asked to rate the extent they believed they had not interacted with someone due to (1) not having an opportunity to interact with others (Opportunity); (2) perceiving that others did not want to interact with them (Isolation); (3) preferring to be alone (Alone); and (4) avoiding interaction with others (Avoidance). Participants were asked to respond to each item. Each item was rated on a 7-point scale from not at all (1) to very much (7).

### *1.3.2. Mood items*

Mood was captured using items from the Profile of Mood States (Shacham, 1983). The specific items selected were used in a previous ESM study (Harper et al., 2019). Items assessed positive and negative affect and were rated on a 7-point scale from not at all (1) to very much (7) with

higher scores indicating more positive or negative mood. The positive affect items (i.e., happy, confident, satisfied, good) were correlated with each other between 0.80 and 0.87; therefore, they were combined into a composite, Positive Affect (PA), by taking the average rating across items. The negative affect items (i.e., sad, anxious, and irritable) were analyzed separately because the bivariate correlations were not as high compared to the positive affect items (see Table 1).

#### *1.4. Procedure*

Participants completed an initial survey to determine their eligibility for the study (i.e., owning a smartphone, 18 years and older). Following informed consent, they were prompted to register their phone number in SurveySignal for the ESM surveys and then were directed to Qualtrics, where they completed the individual differences measures (e.g., MPS and ASQ) and demographics. Beginning the following morning, participants received links to the ESM surveys via text messages at 10:00 am, 4:00 pm, and 9:00 pm Eastern Standard Time for 7 days. The ESM survey links were active for 2 h and were time- and date-stamped to ensure they were completed within the time window. Approximately 35% of participants selected the Central Standard Time when they registered their phone number in SurveySignal; therefore, they received their surveys one hour later.

This ESM procedure was based on an interval-contingent schedule (Christensen et al., 2003, Nezlek, 2012). Interval-contingent signaling is appropriate for studying more frequent events, such as interactions with other people. Interval-contingent signaling requires people to reconstruct what has happened since the last report (Bolger, Davis, & Rafaeli, 2003, Christensen et al., 2003); therefore, having time points relatively close together can reduce difficulty with recall. We wanted to have enough time between intervals that participants had a chance to interact with others, and potentially have a negative social interaction; however, we also wanted the recall window to be a relatively short period of time (i.e., 3 h) to reduce difficulty with recall. We used Mushquash and Sherry (2012) number of surveys per day (3 times a day for 7 days) to provide enough time points to measure within- and between-person variability.

To ensure that the daily survey was equivalent length if participants did not have social interactions in the past 3 h, branching questions were used. If participants responded that they did not have a social interaction, they were asked whether they experienced general positive and negative events. Therefore, the survey was approximately the same length whether participants reported having a social interaction or not. For the purpose of the current study, only data about negative social interactions were included in analyses. Participants were awarded partial research credit for completing at least 75% of the surveys. The response rate (85%) was comparable or higher than other ESM studies utilizing SurveySignal (Hofmann & Patel, 2015).

#### *1.5. Analytic strategy*

Due to the nested nature of the data (ESM variables nested within participants), multilevel modeling was used to test the hypotheses. Perfectionism subscales (SPP and SOP) and trait attributional styles (ASQ Positive and ASQ Negative) were Level 2, between-person, variables. ESM scales (event-specific attributions, PA) and ESM single-items (negative affect mood items and reasons for no social contact) were Level 1, within-person, variables. Within-person variables were group-mean centered in models. As recommended, all between-person variables were standardized in the models to allow for examination of the magnitude of the effects and

**Table 1.** Means, standard deviations, intraclass correlations, and bivariate correlations for event-specific attributions and mood items.

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>ICC</i>	1	2	3	4	5	6	7	8
1. Happy	2529	4.60	1.70	0.45	–							
2. Confident	2526	4.40	1.82	0.54	0.80***	–						
3. Satisfied	2527	4.47	1.85	0.45	0.83***	0.83***	–					
4. Good	2524	4.47	1.45	0.52	0.80***	0.87***	0.84***	–				
5. Sad	2525	2.10	1.56	0.39	–0.50***	–0.46***	–0.50***	–0.46***	–			
6. Anxious	2525	2.66	1.63	0.41	–0.33***	–0.34***	–0.36***	–0.36***	0.55***	–		
7. Irritable	2526	2.17	1.66	0.28	–0.49***	–0.42***	–0.50***	–0.43***	0.60***	0.53***	–	
8. Event-specific attributions	403	3.67	1.29	0.29	–0.15	0.20**	0.18*	0.18**	0.21***	0.09	0.10	

**Note:** *N* = number of observations. *ICC* = intraclass correlation. Within-person correlations from the whole sample. \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

comparisons across predictors (Lorah, 2018). Models were estimated using Mplus 8 with maximum likelihood estimation with robust standard errors.

The first set of analyses examined whether perfectionism (SPP and SOP) predicted ESM variables (event-specific attributions and reasons for no social contact). Both SPP and SOP were included in models to examine the unique effects of each dimensions on the dependent measure (Stoeber, Noland, Mawenu, Henderson, & Kent, 2017). Additionally, ASQ Negative was included as a covariate in the model examining whether SPP and SOP predicted event-specific attributions over and above trait attributional style.

The second set of analyses tested whether event-specific attributions covaried with mood (PA and negative affect mood items). The third set of analyses examined whether perfectionism (SPP and SOP) moderated the covariation between event-specific attributions and mood (PA and negative affect mood items). This was examined using cross-level interactions where the slope of event-specific attributions and mood (e.g., PA) is the outcome and regressed onto SPP and SOP. ASQ Negative was included as a covariate in these models to examine whether dimensions of perfectionism moderated the covariation of event-specific attributions and mood over and above trait attributional style. These results were interpreted using a cutoff of  $p < 0.05$ . Unstandardized regression coefficients are reported for the cross-level interactions of perfectionism predicting the slope of event-specific attributions and mood items as standardized coefficients are not straightforward to compute in multilevel models with random slopes. Standardized regression coefficients are reported for all other models. Syntax, data, and output are available ([osf.io/ks5zq](https://osf.io/ks5zq)).<sup>2</sup>

## 2. Results

### 2.1. Descriptive statistics

Tables 1 and 2 present the means, standard deviations, bivariate correlations, and intraclass correlations for the ESM variables (event-specific attributions and mood) and the between-level variables, respectively.

As expected, SPP was positively correlated with ASQ Negative, indicating that people higher on SPP tend to have a more negative attributional style. Contrary to predictions and previous research, SOP was not correlated with ASQ Negative. Interestingly, SOP was positively correlated with ASQ Positive, suggesting that people high on SOP have a more adaptive attribution style.

The mean number of surveys completed was 17.16 ( $SD = 3.79$ ; range: 2–17). Most participants (90.2%) completed at least 2/3 of the surveys (14 surveys) and 95% completed 7 surveys or more. All together there were 411 observations of negative social interactions (and event-specific attributions) and 2,529 observations for mood items across all days and people. On average, participants reported 2.60 negative social interactions ( $SD = 2.58$ ) that ranged from 0 to 14 negative social interactions. The proportion of negative social interactions reported (compared to total surveys completed) per person ranged from 0 to 0.82. Thirty-two participants (21%) had 0 negative social interactions.



**Table 2.** Perfectionism and event-specific attributions predicting mood.

	<i>N</i>	<i>M</i>	<i>SD</i>	1.	2.	3.	4.
1. SPP	151	60.40	13.82	–			
2. SOP	151	72.74	13.99	0.52***	–		
3. ASQ Positive	150	14.37	2.30	–0.07	0.18*	–	
4. ASQ Negative	150	11.76	2.46	0.26**	0.03	–0.11	–

**Note:** SPP = socially prescribed perfectionism. SOP = self-oriented perfectionism. ASQ Positive and ASQ Negative are subscales from the ASQ. *M* = Mean, *SD* = standard deviation. \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

**Table 3.** Perfectionism and event-specific attributions predicting mood.

	SPP				SOP				Attributions			
	$\beta$	<i>SE</i>	<i>p</i>	95% CI	$\beta$	<i>SE</i>	<i>p</i>	95% CI	$\beta$	<i>SE</i>	<i>p</i>	95% CI
PA	<b>–0.48</b>	<b>0.17</b>	<b>&lt;0.01</b>	<b>[–0.67, –0.10]</b>	0.21	0.15	0.16	[–0.08, 0.51]	<b>–0.22</b>	<b>0.06</b>	<b>&lt;0.01</b>	<b>[–0.34, –0.09]</b>
PA × Attributions	0.10	0.07	0.17	[–0.04, 0.24]	–0.09	0.07	0.21	[–0.22, 0.05]				
Sad	<b>0.65</b>	<b>0.14</b>	<b>&lt;0.01</b>	<b>[0.38, 0.93]</b>	–0.19	0.14	0.19	[–0.47, 0.09]	<b>0.26</b>	<b>0.05</b>	<b>&lt;0.01</b>	<b>[0.17, 0.35]</b>
Sad × Attributions	–0.22	0.12	0.07	[–0.45, 0.01]	<b>0.25</b>	<b>0.10</b>	<b>0.01</b>	<b>[0.06, 0.43]</b>				
Anxious	<b>0.48</b>	<b>0.17</b>	<b>&lt;0.01</b>	<b>[0.14, 0.81]</b>	–0.02	0.16	0.88	[–0.35, 0.30]	0.10	0.07	0.14	[–0.03, 0.22]
Anxious × Attributions	–0.01	0.15	0.93	[–0.31, 0.28]	0.14	0.11	0.22	[–0.08, 0.35]				
Irritable	<b>0.49</b>	<b>0.16</b>	<b>&lt;0.01</b>	<b>[0.18, 0.80]</b>	–0.01	0.14	0.93	[–0.29, 0.27]	0.07	0.07	0.28	[–0.06, 0.21]
Irritable × Attributions	–0.00	0.14	0.52	[–0.28, 0.28]	0.13	0.11	0.26	[–0.10, 0.35]				

**Note:** SPP = socially prescribed perfectionism. SOP = self-oriented perfectionism. PA = Positive Affect composite. Mood items regressed on SPP, SOP, event-specific attributions for the whole sample. Cross-level interaction of SPP and SOP predicting the slope of event-specific attributions and mood items (controlling for ASQ Negative).

## 2.2. Perfectionism and ESM variables

### 2.2.1. Event-specific attributions

Event-specific attributions were regressed on SPP and SOP while controlling for ASQ Negative (see Table 3). Neither SPP nor SOP significantly predicted the attributions composite (SPP:  $\beta = 0.06$ ,  $SE = 0.16$ ,  $p = 0.68$ , 95% CI [-0.24, 0.37]; SOP:  $\beta = 0.05$ ,  $SE = 0.17$ ,  $p = 0.76$ , 95% CI [-0.27, 0.37]). However, ASQ Negative significantly predicted the attributions composite ( $\beta = 0.40$ ,  $SE = 0.12$ ,  $p < 0.01$ , 95% CI [0.17, 0.64]): for one standard deviation increase on ASQ Negative, there was a 0.40 increase on the attributions composite. Results were not different when ASQ Negative (trait attributional style) was omitted as a covariate in the models.

### 2.2.2. Negative social interactions

The proportion of negative social interactions reported was regressed onto SPP and SOP. SPP significantly predicted a higher proportion of negative social interactions across surveys ( $\beta = 0.24$ ,  $SE = 0.09$ ,  $p = 0.01$ , 95% CI [0.06, 0.41]): for one standard deviation increase on SPP, there was a 0.24 increase in proportion of negative social interactions. SOP, in contrast, did not significantly predict the proportion of negative social interactions ( $\beta = -0.04$ ,  $SE = 0.10$ ,  $p = 0.64$ , 95% CI [-0.23, 0.14]).

### 2.2.3. Reasons for no social contact

Exploratory analyses were conducted to examine whether SPP or SOP predicted reasons for no social contact (Opportunity, Alone, Isolation, Avoidance). Neither SPP or SOP predicted Opportunity (i.e., not having an opportunity to interact with others; SPP:  $\beta = -0.12$ ,  $SE = 0.15$ ,  $p = 0.42$ , 95% CI [-0.40, 0.17]; SOP:  $\beta = 0.02$ ,  $SE = 0.14$ ,  $p = 0.90$ , 95% CI [-0.25, 0.28]). SPP positively predicted Alone (i.e., preferring to be alone;  $\beta = 0.34$ ,  $SE = 0.11$ ,  $p < 0.01$ , 95% CI [0.12, 0.55]), Isolation (i.e., perceiving others did not want to spend time with them;  $\beta = 0.30$ ,  $SE = 0.13$ ,  $p = 0.02$ , 95% CI [0.04, 0.55]), and Avoidance (i.e., avoiding social interaction;  $\beta = 0.39$ ,  $SE = 0.12$ ,  $p < 0.01$ , 95% CI [0.15, 0.62]). SOP, in contrast, negatively predicted Alone ( $\beta = -0.26$ ,  $SE = 0.12$ ,  $p = 0.03$ , 95% CI [-0.50, -0.02]). SOP did not predict Isolation ( $\beta = -0.15$ ,  $SE = 0.15$ ,  $p = 0.32$ , 95% CI [-0.46, 0.15]) or Avoidance ( $\beta = -0.24$ ,  $SE = 0.13$ ,  $p = 0.07$ , 95% CI [-0.49, 0.02]). In summary, people high on SPP reported they did not have social interaction because they preferred to be alone, because they perceived others did not want to spend time with them, and because they avoided interacting with others. People high on SOP reported lower levels of preferring to be alone as a reason for no social contact.

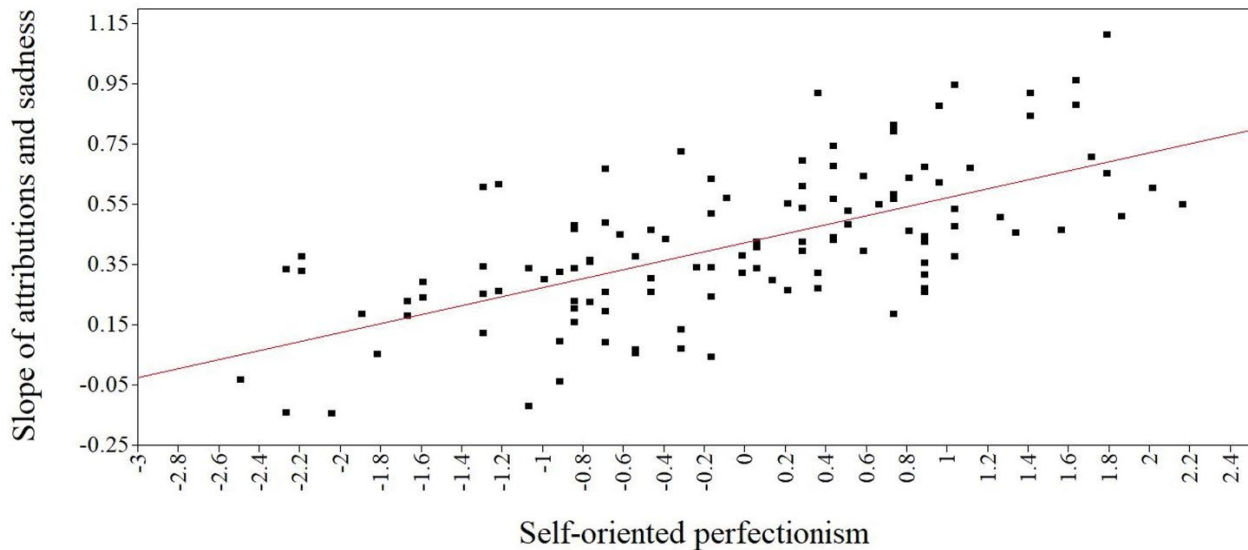
## 2.3. Event-specific attributions and mood

Negative affect mood items and PA were regressed on the event-specific attributions composite (see Table 3). Having more negative attributions about negative social events was related to lower levels of PA and higher levels of sadness. Attributions about negative social events were not related to other measures of negative affect (i.e., irritable or anxious).

## 2.4. Perfectionism and covariation of event-specific attributions and mood

To test the moderating effect of perfectionism on the covariation of event-specific attributions and mood, the slope of attributions and mood (PA and negative mood items) was regressed on SPP and SOP (ASQ Negative was included in models as a covariate). SOP positively predicted the slope of negative attributions and sadness (see Table 3 and Fig. 1): as SOP scores increased by one standard deviation, the association between making negative attributions and sadness became stronger by 0.25 points. However, neither SPP

nor SOP predicted the slope of negative attributions and the other mood items (see Table 3). Results were not different when ASQ Negative (trait attributional style) was not included as a covariate in the models.



**Fig. 1.** The relationship between self-oriented perfectionism and the slope of causal attributions and sadness. As scores increase on self-oriented perfectionism, the association between causal attributions and sadness becomes more positive (i.e., stronger).

### 3. Discussion

The primary aim of the current study was to examine whether SPP and SOP were related to causal attributions (measured both at the trait and event-specific levels), and to what extent event-specific attributions about social interactions were related to mood. Neither SPP nor SOP were associated with event-specific attributions; however, they were differently related to trait attributional styles. Additionally, to the extent that people high on SOP made internal, global, and stable attributions about a negative social interaction, they experienced higher levels of sadness. A secondary aim of the study was to examine whether perfectionism was related to daily negative social interactions and reasons for no social contact to better understand social functioning. People high on SPP had more negative social interactions and were more likely to report not having social interactions because they preferred to be alone, were avoiding social contact, and perceived others did not want to be around them.

In partial support of our hypotheses, SOP moderated the covariation of event-specific attributions and sadness. Specifically, as scores increased on SOP, the association between making internal, stable, and global attributions about negative social interactions and feeling sad became stronger. This effect is consistent with the finding that suggests people high on SOP with negative attributional styles report higher depressive symptoms (Chang & Sanna, 2001). However, contrary with our hypotheses, people high on SOP tended to make internal, global, and stable attributions about positive events (i.e., positive attributional style). To our knowledge, only one other study examined the association between SOP and trait attributional style (Chang & Sanna, 2001). Although Chang and Sanna (2001) found that SOP was positively associated with negative trait attributional style, the correlation was not as strong as SPP's correlation with negative trait attributional style. Additionally, Chang and Sanna (2001) did not measure positive attributional style; therefore, this was the first study to examine the correlation between SOP and positive trait

attributional style. Taken together, it appears that although people high on SOP tended to make positive attributions (measured at the trait level), when they made negative attributions in daily life, it was maladaptive (i.e., associated with higher levels of sadness). This is in line with previous findings that indicate that SOP's relation to negative emotional outcomes may be contextual (Hewitt & Flett, 1993). The findings suggest that attributions about negative social interactions may be one contextual factor that impacts mood for people high on SOP.

Consistent with previous research (Chang & Sanna, 2001), SPP was positively associated with a negative attributional style (i.e., the tendency to make internal, global, and stable attributions about negative events). However, in contrast to expectations, SPP was not related to event-specific attributions or the covariation of attributions and mood. One possible explanation is that the assessment of negative social interactions and the causal attributions about them did not capture interpersonal sensitivity, which is known to impact socially prescribed perfectionists' mood. A recent study found that the emotional response to negative social interactions (i.e., sadness), but not the accumulation of negative social interactions, mediated the association between SPP and depression (Mandel, Dunkley, & Starrs, 2018). It is possible that the assessment in the current study of negative social interactions and the associated causal attributions did not capture emotionally impactful social interactions, and therefore did not explain variations in socially prescribed perfectionists' mood.

Although SPP was not related to event-specific attributions, it was related to the proportion of negative social interactions reported and reasons for not having social contact. Consistent with previous findings (Nepon et al., 2011), people high on SPP had a larger proportion of daily negative social interactions. Additionally, people high on SPP reported that, when they did not have social contact, it was because they perceived others did not want to spend time with them. Previous research suggests that SPP is associated with interpersonal discrepancies (i.e., perceiving one is not meeting others' expectations; Smith et al., 2018) and rejection sensitivity (Flett, Besser, & Hewitt, 2014). Taken together, people high on SPP may believe that others do not want to spend time with them because they perceive they are not meeting others' standards and are sensitive to rejection. The current study also found that people high on SPP reported not having social interactions due to preferring to be alone and avoiding interactions with others. This finding is consistent with research suggesting that SPP is associated with social anxiety disorder (Bieling & Alden, 1997), as social avoidance is a core component of social anxiety. In sum, these findings suggest that people high on SPP are concerned about meeting others' standards and perceive others do not want to spend time with them; therefore, they may avoid social contact with others potentially to avoid rejection. Additionally, when they do interact with others, they perceive a higher number of negative social interactions, which likely impacts future avoidance. Future research on how these social cognitions relate to behaviors and mood in people high on SPP is warranted.

There were several limitations of the current study. First, the surveys were interval-contingent (i.e., every 5 h) and asked people to recall social interactions in the past three hours. Although this structure hopefully reduced difficulty with recall, there were likely negative social interactions outside of those three hours that were not captured. The one study that examined event-specific attributions in daily life allowed participants to report on 5 different negative events, and then select the one they perceived as the most negative (Hankin et al., 2005). It is possible that due to the survey schedule, the most impactful social events were not captured, and those that were captured may have not been the most emotionally salient. As mentioned previously, this may be why SPP was not associated with event-specific attributions. The interactions themselves, and the

causal attributions about the interactions, may have been less emotionally impactful. Additionally, because the surveys were interval-contingent, they may not have captured the total number of negative social interactions in a day. The current study also did not have participants report on whether they had neutral interactions, and their appraisals of neutral interactions; therefore, the current study did not fully capture the spectrum of interactions that perfectionists are likely having in their lives. Future studies examining negative social interactions in perfectionists may want to consider using more frequent event-contingent surveys to capture a more accurate account of the quantity of negative social interactions or quantity of any social interactions (Moskowitz & Sadikaj, 2012). However, other studies aimed at examining appraisals about negative events, the impact on mood, and the relation to perfectionism may want to consider less frequent surveys to capture the most emotionally salient events of the day.

Second, the study examined perceived negative social interactions broadly (e.g., “someone got mad at me,” “I got annoyed with someone,” “I felt rejected, felt criticized, ignored, left out,” or “someone didn’t answer my text”) instead of measuring objective negative interactions or specific types of negative social interaction (e.g., rejection). Additionally, the current study did not have participants report on the person the perceived negative social interaction was with. There is a possibility that negative interactions with specific people, such as parents, friends, or romantic partners, have different effects on mood compared to interactions with strangers (e.g., customers at a job). Previous research on perfectionism and conflict between romantic partners (Mackinnon et al., 2012) and perceived discrepancies in mother-daughter dyads (Mushquash & Sherry, 2013) suggest that these factors have a negative impact on mental health outcomes. Future research on casual attributions regarding specific types of negative interactions or specific people may be helpful (Bolger and Laurenceau, 2014).

Finally, the current study used a student sample, which may not generalize to other populations, such as clinical samples. Although the current study over-sampled individuals who scored higher on perfectionism, non-clinical samples tend to have lower ratings of daily negative affect (Barge-Schaapvel et al., 1999) and lower perfectionism scores compared to clinical samples (Hewitt and Flett, 1991, Hewitt et al., 1991). Additionally, because the current study oversampled people high on SPP these results may not generalize to all student samples with varying levels of perfectionism. Although the ESM measures were based on previous research (Hankin et al., 2005, Harper et al., 2019, Kwapil et al., 2009), the ESM procedure was novel. As mentioned previously, we expect that the results regarding negative social interactions, causal attributions about the interactions, and affect may differ depending on the time interval of surveys. Future research is needed to replicate these findings. Additionally, while not a focus of the current study, future studies would benefit from examining the lasting impact of negative social interactions, such as examining whether negative social interactions from the previous day impact emotions, cognitions, or behaviors the following day.

The current study was the first to our knowledge to examine daily event-specific causal attributions about negative social interactions and perfectionism. The differential associations between perfectionism, event-specific attributions, and trait attributions suggest the importance of examining both trait and within-person attributions, especially in relation to SOP. Previous research suggests that the association between SOP and negative emotional outcomes is contextual, and the current study suggests that event-specific attributions may be an important contextual factor. Additionally, the findings provided further support suggesting that people high on SPP have difficulty with social functioning. Findings regarding the reported reasons for no social contact should be replicated; however, results suggest that people high on SPP may avoid

social interactions and perceive higher proportions of negative social interactions, which may impact future avoidance. Future research on perfectionists' social functioning in daily life and the role of causal attributions (both trait and event-specific) is needed as this may provide further insight into perfectionists' emotional experience.

### **Author contributions**

KLH designed the methods/procedure with help of PJS and KME. KLH collected the data for the study. KLH analyzed the data with help of PJS and KME. KLH wrote the manuscript and all authors edited the manuscript.

### **Acknowledgements**

This research was funded in part by the Thesis/Dissertation Fund at the University of North Carolina at Greensboro.

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