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Peer Adversity Predicts Interpersonal Needs in Adolescent Girls

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The need to belong (NTB) and need for approval (NFA) are fundamental interpersonal needs vital to social development. Although these needs are universal, individual differences in the strength of these needs likely emerge from critical social experiences. In particular, given the growing salience of peer social evaluation and belonging across adolescence, interpersonal needs during this stage may be strongly tied to both early and recent experiences in the peer group. The aim of the present study was to examine the contribution of lifetime and recent peer adversity to both general and situation-specific interpersonal needs in a sample of adolescent girls (N = 89, M_{age} = 15.85). Results revealed that recent peer adversity predicted avoidance-oriented NFA, whereas a significant interaction between lifetime and recent peer adversity predicted approach-oriented NFA. Although neither lifetime nor recent peer adversity predicted individual differences in NTB, both predicted threats to interpersonal needs in the context of a laboratory manipulation of social exclusion. Specifically, both lifetime and recent peer adversity predicted greater need-threat prior to the exclusion, but only individuals who had experienced lifetime peer adversity continued to display ongoing high levels of threatened interpersonal needs.

Key words: peer adversity – adolescence – need to belong – need for approval

Interpersonal needs, such as the need to belong (NTB; i.e., the desire to form and maintain meaningful interpersonal attachments; Baumeister & Leary, 1995; Crowne & Marlowe, 1960) and need for approval (NFA; i.e., the extent to which self-worth is contingent on approval; Rudolph & Bohn, 2014), are fundamental to human development and well-being. Indeed, failure to meet these needs has adverse consequences for social and mental health (Baumeister & Tice, 1990; Leary, 1990; Peplau & Perlman, 1982; Rudolph & Bohn, 2014; Williams, Shore, & Grahe, 1998). Although these needs are universal, their strength is not uniform across individuals, and little is known about their origins. The present study examined how peer experiences contribute to individual differences in interpersonal needs during adolescence, a stage characterized by increasing salience of peer group belonging and approval (Rankin, Lane, Gibbons, & Gerrard, 2004; Somerville, 2013; Westenberg, Drewes, Goedhart, Siebelink, & Treffers, 2004). Specifically, we examined the individual and joint contributions of exposure to lifetime and recent peer adversity (e.g., victimization, peer rejection, friendlessness) to NTB and NFA in adolescent girls. Identifying how social experiences contribute to individual differences in interpersonal needs can provide insight into potential targets of intervention following peer adversity.

Interpersonal Needs

According to the belonging regulation model (Gardner, Pickett, & Knowles, 2005), interpersonal needs are regulated via consistent monitoring, similar to physiological states such as hunger. Specifically, it is proposed that an internal Social Monitoring System (SMS) regulates interpersonal needs by assessing current levels of social inclu-

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sion, monitoring the environment for social cues and opportunities, and using these cues to facilitate social interactions. Gardner and colleagues propose that when individuals experience threats to their social inclusion and acceptance, they resort to "social snacking." Similar to snacking on food when one is hungry, individuals who partake in social snacking indulge any type of social interactions to feed their social hunger and bring their SMS back to equilibrium (Gardner, Pickett, & Brewer, 2000). Essentially, the SMS is thought to prompt the initiation of positive interactions with others in an effort to reconnect following threats to one's need to belong. Key to functioning of the SMS is an individual's level of self-esteem, hypothesized to serve as a sociometer that provides feedback when interpersonal needs are threatened (Leary, Tambor, Terdal, & Downs, 1995). In the present study, we examined two needs that may be integral to the functioning of the SMS: the need to belong (NTB) and the need for approval (NFA).

Need to belong. The belongingness hypothesis proposes that all individuals possess an innate drive to create and preserve positive and significant interpersonal relationships (Baumeister & Leary, 1995), regardless of societal or cultural norms (Williams, 1997). To fulfill this need to belong, individuals form stable, positive relationships with other people that involve mutual caring for each other's welfare. Research involving laboratory-manipulated experiences of acute peer rejection supports the notion that NTB is a universal drive as findings suggest that rejection promotes a motivation to re-gain a sense of belonging (Gardner et al., 2000; Pickett, Gardner, & Knowles, 2004). Simply recalling personal times of intense social rejection within the laboratory (compared to academic failures or normal day-to-day-activities) leads to greater attention to social cues (Pickett et al., 2004). Further, participants exposed to an acute social rejection through a chat room task become more attuned to the social events of peers (i.e., better memory and retention of explicitly social events compared to other nonsocial information written in peer diary entries) than their accepted counterparts (Gardner et al., 2000). Additionally, social exclusion induced via Cyberball (Hartgerink, van Beest, Wicherts, & Williams, 2015; Williams, Cheung, & Choi, 2000) undermines feelings of belongingness, as well as other basic needs for self-esteem, meaningful existence, and control (Williams et al., 2000; Zadro, Williams, & Richardson, 2004), suggesting adverse consequences when belonging needs are challenged. More generally, research documents several adverse outcomes when individuals face circumstances that threaten their belongingness needs, including higher levels of stress arousal (Baumeister & Leary, 1995), loneliness (Peplau & Perlman, 1982), anxiety (Baumeister & Tice, 1990; Leary, 1990), aggression (Twenge, Baumeister, Tice, & Stucke, 2001), self-defeating behavior, and social helplessness (Twenge, Catanese, & Baumeister, 2003).

Despite the demonstrated support for NTB as a universal need, there are varying degrees to which individuals experience NTB and its consequences. Following an exclusion manipulation, individuals with high NTB exhibit more interpersonal social sensitivity (ability to accurately identify vocal tone and facial expressions; Pickett et al., 2004); moreover, after recalling previous experiences of intense social rejection, high NTB is associated with more empathic accuracy when asked to interpret others' emotions in social situations (Pickett et al., 2004). Beyond this heightened interpersonal sensitivity, higher levels of NTB predict more adverse outcomes following threats to belonging needs. Compared to individuals with low NTB, individuals with high NTB have more self-esteem loss after imagining themselves in negative social interactions or experiencing a social rejection manipulation (Tyler, Branch, & Kearns, 2016).

Need for approval. Need for approval is conceptualized as a reliance on social approval and appraisals by others in order to determine self-worth (Harter, Stocker, & Robinson, 1996). This need involves both approach motivation, as reflected in the motivation to gain positive judgments (enhanced self-worth in the face of approval; NFA_{app}), and avoidance motivation, as reflected in the motivation to avoid negative judgments (low self-worth in the face of disapproval; NFA_{avoid}; Rudolph, Caldwell, & Conley, 2005). Factor analytic work validates this two-dimensional structure of NFA, revealing that NFA_{app} and NFA_{avoid} represent distinct yet correlated constructs (Rudolph, 2021; Rudolph & Bohn, 2014; Rudolph et al., 2005).

Across development, NFA naturally tends to decrease as youth gain a more stable sense of self that is independent of the judgments of others (Harter, 1998). During adolescence, however, an increasing influence of peer evaluation and approval on self-worth (Brown, 1990; Harter, 1998; Harter, Waters, Whitesell, & Kastelic, 1998) may intensify NFA in vulnerable youth. This

overreliance on approval for self-worth may result in a self-concept that fluctuates according to the views of others (Harter et al., 1996). Indeed, several theories of personality development not only highlight individual differences in contingent self-worth but also implicate approval or success in relationships as one key source of such differences (Blatt & Homann, 1992; Crocker & Wolfe, 2001; Fritz & Helgeson, 1998).

Although having a self-concept that fluctuates based on approval from others may be detrimental for development, distinguishing between NFA_{app} and NFA_{avoid} leads to a more nuanced perspective on the consequences of NFA. Youth who are motivated by NFA_{app} may be more likely to act in a prosocial manner in an effort to receive positive feedback and may be buffered against emotional distress. In contrast, youth who are motivated by NFA_{avoid} may withdraw from social situations in an effort to avoid disapproval and may spend more energy worrying about their social acceptance, perhaps leading to self-doubt, worry, and hopelessness. Consistent with these ideas, youth motivated by NFA_{app} show higher levels of social competence (Rudolph & Bohn, 2014) and are buffered against emotional distress (Rudolph et al., 2005), whereas youth motivated by NFA_{avoid} show lower levels of social competence (Rudolph & Bohn, 2014) and more emotional distress, particularly when they receive negative social feedback (Rudolph et al., 2005).

Origin of Individual Differences in Interpersonal Needs

Although research demonstrates that acute peer adversity (e.g., rejection in the lab) activates the SMS in the short term, thereby altering sensitivity to social cues (Gardner et al., 2000; Pickett et al., 2004), little is known about longer-term calibration of the SMS or relevant interpersonal needs such as NTB and NFA. Earlier peer adversity may be one key contributor to individual differences in the functioning of the SMS. While a moderately active SMS can be adaptive in the short term by enhancing alertness to social cues in ways that help youth improve their relationships, chronic exposure to social experiences that threaten belonging needs may lead to an SMS that is overactive or remains active over extended periods of time (Gardner et al., 2000). Thus, experiences of peer adversity may contribute to heightened NTB and NFA, particularly a need to avoid disapproval by peers.

Despite existing theory, relatively few studies have explored whether exposure to peer adversity predicts individual differences in interpersonal needs. Consistent with the proposed unfavorable effects of peer adversity, research links exposure to peer victimization and rejection with lower global and social self-worth (Hawker & Boulton, 2000; McDougall, Hymel, Vaillancourt, & Mercer, 2001; McDougall & Vaillancourt, 2015; Salmivalli, Lagerspetz, Björkqvist, Österman, & Kaukiainen, 1996), and heightened rejection sensitivity (Downey & Feldman, 1996; Zimmer-Gembeck, Trevaskis, Nesdale, & Downey, 2014). Moreover, one study revealed that adolescent girls with a history of chronic victimization reported higher threats to their social needs after exclusion during Cyberball compared to nonvictimized girls (Rudolph, Miernicki, Troop-Gordon, Davis, & Telzer, 2016). Finally, a recent longitudinal study found that peer victimization is associated with increases in NFA_{avoid} and decreases in NFA_{app} over time (Xu, Troop-Gordon, & Rudolph, 2020). However, a comprehensive understanding of the connection between peer adversity and interpersonal needs is still lacking, highlighting the need for additional work. To address this gap, we examined the contribution of peer adversity to both general interpersonal needs (NTB, NFA), as well as situation-specific threats to interpersonal needs (i.e., following rejection during the Cyberball paradigm). Given that the SMS may become particularly sensitive to social cues when experiences of earlier peer adversity are coupled with more recent adverse peer experiences (O'Connor, 2003), we examined whether lifetime peer adversity contributes to interpersonal needs and whether these effects are reinforced by subsequent peer adversity (i.e., experiences in the past year).

Study Overview and Hypotheses

Despite a growing body of work demonstrating individual differences in NTB and NFA and establishing their consequences for adjustment, studies examining the origin of such differences is still quite scarce. To address this gap, the present study examined the contribution of both early and recent peer adversity to individual differences in interpersonal needs during adolescence. Exposure to peer adversity may cause youth to become "socially starved" (Gardner et al., 2000; Pickett et al., 2004), leading the SMS to become oversensitive to cues of belongingness and approval. Social experiences that threaten belonging needs may contribute to heightened NTB and NFA, particularly a need to

avoid disapproval by peers. Thus, consistent with work showing that social exclusion increases the motivation to re-gain a sense of belonging and acceptance (Maner, DeWall, Baumeister, & Schaller, 2007), we hypothesized that exposure to lifetime peer adversity would predict higher levels of NTB and NFA_{avoid} (Hypothesis 1). However, youth who have received prior negative feedback may have difficulty integrating subsequent peer approval into their sense of self (Rudolph, 2021); thus, consistent with work showing that peer victimization predicts declines in NFA_{app} (Xu et al., 2020), we predicted that a history of peer adversity would predict lower levels of NFA_{app} (Hypothesis 2). Consistent with prior research (Rudolph et al., 2016), we also predicted that exposure to lifetime peer adversity would predict greater threat to interpersonal needs in the context of a laboratory social rejection (Hypothesis 3). Finally, because lifetime peer adversity may exert particularly potent long-term negative effects when these early experiences are reinforced by subsequent stressors (O'Connor, 2003), we hypothesized that lifetime and recent peer adversity would contribute jointly to interpersonal needs (Hypothesis 4).

We examined these hypotheses in a sample of adolescent girls. During this developmental period, youth increase their focus and dependence on peers (Csikszentmihalyi & Larson, 1984; Masten et al., 2009; Steinberg & Morris, 2001). This transition is accompanied by an increase in time spent with peers (Csikszentmihalyi & Larson, 1984), the meaningfulness of peer evaluation (Nelson, Leibenluft, McClure, & Pine, 2005; Westenberg et al., 2004), and an increase in the salience of peer acceptance, sensitivity to rejection, and desire to conform (Allen, Porter, McFarland, Marsh, & McElhaney, 2005; Rankin et al., 2004; Somerville, 2013). This increasing salience of peers is particularly relevant to adolescent girls. Compared to boys, adolescent girls develop more intimate friendships, experience more anxiety about being rejected by their peers (Berndt, 1982), and show more emotional distress in response to difficulties in their relationships (Rudolph, 2002). Additionally, not only do girls recall experiencing more social aggression, they also report more negative thoughts and feelings than boys after such experiences (Paquette & Underwood, 1999). Taken together, previous work suggests that peer adversity may be particularly relevant for understanding adolescent girls' interpersonal needs.

METHOD

Participants

Participants included 89[1] adolescent females between ages 14–17 (M = 15.85 years, SD = 0.89; 66.3% White, 21.3% African American, 4.5% Latina, 1.1% Asian, 6.7% other) who were recruited from schools in the Midwest region of the United States. Participants were targeted from either a longitudinal study of peer victimization (N = 92) or during school registrations through local schools (N = 85). Participants were asked to participate in a longitudinal study aimed at understanding the psychological and neural correlates of peer adversity. In order to reach a target sample size of 90, a total of 177 girls were targeted, 43 of which were ineligible due to MRI contraindications (e.g., metal braces, claustrophobia), and an additional 44 declined to participate. Participants came from families with diverse socioeconomic backgrounds: 27.8% income $0–$29,000, 24% income $30,000–$59,000, and 46.7% income above $60,000; female caregiver education: 1.1% completed less than high school, 12.2% high school education, 62.2% college education, 20% postcollege education/professional degree, 4.4% unknown; male caregiver education: 1.1% completed less than high school, 27.7% high school education, 36.6% college education, 18.8% postcollege education/professional degree, 15.5% unknown. Parents provided written consent and adolescents provided written assent. Participants received a monetary compensation.

Procedures

Girls participated in two laboratory sessions in the summer following 9th or 10th grade. In one session, they independently completed self-report measures assessing NTB (Leary, Kelly, & Schreindorfer, 2001), NFA (Rudolph et al., 2005), and Need-Threat (van Beest & Williams, 2006). In the same session, participants completed Cyberball (Williams et al., 2000) while undergoing fMRI and then repeated the measure of Need-Threat approximately 15 min after Cyberball, as well as 35 min after Cyberball. In another session, trained interviewers conducted a semi-structured interview assessing lifetime and recent peer adversity. The two sessions were conducted within 2 weeks of one another.

[1]One participant was removed from analyses because they were missing several self-report measures included in the present study.

Measures

Table 1 shows descriptive data and reliability of the measures. All measures showed acceptable internal consistency.

Need to Belong. The Need to Belong Scale (Leary et al., 2001) consists of 10 self-report items designed to assess belonging needs and the desire to be accepted by others (e.g., "I want other people to accept me."). Participants rated to what degree they agreed or disagreed with each item on a 5-point Likert scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*). Scores were computed as the mean of the items, with higher scores reflecting higher levels of NTB. Prior research has established strong reliability and validity for this measure (Leary, Kelly, Cottrell, & Schreindorfer, 2013).

Need for Approval. The Need for Approval Questionnaire (Rudolph et al., 2005) consists of two subscales. The NFA_{app} subscale assesses the extent to which a child's enhanced self-worth is contingent on peer approval and acceptance (4 items; e.g., "Being liked by other kids makes me feel better about myself."). The NFA_{avoid} subscale assesses the extent a child's diminished self-worth is contingent on peer disapproval and rejection (4 items; e.g., "I feel like I am a bad person when other kids don't like me."). For both subscales, participants rated how true each item was on a 5-point Likert scale (1 = *Not at All* to 5 = *Very Much*). Scores were computed as the mean of the items, with higher scores reflecting higher levels of NFA_{app} and NFA_{avoid}. This measure shows strong reliability and convergent, as well as discriminant validity (Rudolph & Bohn, 2014; Rudolph et al., 2005).

Lifetime Peer Adversity. The Lifetime Adversity section of the Youth Life Stress Interview (YLSI; Rudolph & Flynn, 2007) was used to assess adolescents' exposure to peer adversity across their lifetime up until the year prior to the interview (to prevent overlap with recent peer adversity). The interviewer first provided a general probe regarding the occurrence of stressful events in the peer domain throughout a child's lifetime. Following this general probe, questions were asked about the occurrence of specific events across a variety of domains, including friendlessness (e.g., "Have you been left out/excluded, when nobody liked you and you didn't have any friends at all?"), friendship conflict (e.g., "Was there ever a time when you were having serious arguments/fights with your close friends that lasted for a long time?"), rejection (e.g., "Have you been left out/excluded by the rest of the kids at school for a long period of time, when no one wanted to play/hang out with you?"), victimization (e.g., "Was there ever a period of time when you were being severely bullied at school or outside of school?"), and romantic conflict (e.g., "Have you ever had serious problems [violence, extreme arguments] with someone you were dating?"). Based on follow-up questions concerning the context, timing, and duration of the adversity, interviewers prepared a narrative summary of each event that was presented to an independent team of coders who had no prior knowledge of the youth or their life circumstances. The coders assigned a rating of cumulative lifetime peer adversity on a 10-point scale (1 = *None to* 10 = *Severe*) utilizing all the information provided. To assess reliability, two independent teams of raters coded 25% of interviews. High reliability

TABLE 1
Intercorrelations Among Study Variables

Variable	*α*	*Mean* (SD)	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1. Lifetime peer adversity	.99	2.92 (1.96)	–							
2. Recent peer adversity	.95	2.67 (0.93)	.53**	–						
3. NTB	.73	3.09 (0.65)	−.01	−.09	–					
4. NFA_{avoid}	.92	1.84 (0.92)	.22*	.43**	.54**	–				
5. NFA_{app}	.92	2.92 (0.99)	−.26*	−.32**	.30**	.58**	–			
6. T_1 Need-Threat	.90	2.25 (0.76)	.33**	.46**	.21*	.49**	−.31**	–		
7. T_2 Need-Threat	.88	2.70 (0.71)	.05	.19	.27*	.29**	.07	.51**	–	
8. T_3 Need-Threat	.90	2.18 (0.68)	.41**	.53**	.35**	.45**	−.24*	.78**	.39**	–

Note. NTB = Need to belong; NFA_{avoid} = Avoidance need for approval; NFA_{app} = Approach need for approval. Correlations for NFA_{avoid} and NFA_{app} adjust for the alternate dimension. *α* = Cronbach's alpha. Lifetime and recent peer adversity reliability reflects intraclass correlation coefficient across two coding teams.
*$p < .05$; **$p < .01$.

was found for ratings of cumulative peer adversity (α = .99).

Recent Peer Adversity. The Peer Chronic Strain section of the YLSI (Rudolph & Flynn, 2007) was used to assess adolescents' exposure to peer adversity in the past year. Detailed probes were asked about different types of peer adversity, including friendlessness (e.g., "Do you sometimes have trouble making friends or do you have a lot of friends?"), social isolation (e.g., "Do you usually spend your free time alone or with other kids?"), rejection (e.g., "Are you ever left out or excluded by other kids?"), victimization (e.g., "Do other kids tease you, pick on you, or spread rumors about you?"; Have other kids made rude, mean, or embarrassing comments about you online?"), conflict (e.g., "Do you and your friends argue or disagree a lot?"; "Do you have arguments or disagreements with other kids who are not your friends?"), and (lack of) support (e.g., "When something upsetting happens, do you have a friend you could tell?"). Based on follow-up questions concerning the context, timing, and duration of the adversity, interviewers prepared a narrative summary of each event that was presented to an independent team of coders who had no prior knowledge of the youth or their life circumstances. The coders assigned a rating of cumulative peer stress in the past year on a 5-point scale (1 = *No peer stress* to 5 = *Severe social stress*) utilizing all the information provided. To assess reliability, two independent teams of raters coded 25% of interviews. High reliability was found for ratings of recent peer adversity (α = .95).

Need-Threat. Participants completed the Need-Threat Scale (van Beest & Williams, 2006) approximately 30 min before Cyberball (Williams et al., 2000; T_1 Need-Threat), approximately 15 min after Cyberball (T_2 Need-Threat), and again 35 min after Cyberball (T_3 Need-Threat). During Cyberball, participants were told they would be playing an online game with two peers who were ostensibly completing the study in another room and connected via the Internet. Participants could see the photographs of the other two players on a computer screen, as well as their own "hand" that they controlled using a button-box. Throughout the game, a virtual ball was thrown back and forth among players. When the participant received the ball, she returned it to either player by pushing one of two buttons. The throws of the other "players" were controlled by a preset computer program. Each participant completed two rounds in the same order: an inclusion round, in which they were equally included in the ball tosses, and an exclusion round, in which they were excluded after 10 ball tosses.

The Need-Threat Scale consists of 12 items assessing feelings of rejection (e.g., "I felt rejected"), belongingness (e.g., "I felt disconnected"), self-esteem (e.g., "I felt good about myself), and social control (e.g., "I felt powerful"). Participants rated how true each item was on a 5-point Likert scale (1 = *Not at All* to 5 = *Very Much*) according to how they felt prior to playing Cyberball (T_1 Need-Threat), how they felt while they were playing Cyberball (T_2 Need-Threat), and how they felt approximately 35 min after Cyberball (T_3 Need-Threat). Consistent with prior research (Williams et al., 2000; Zadro et al., 2004), positively worded items were reverse coded, and scores were computed as the mean of the items, with higher scores reflecting greater threat to one's needs. Confirming the validity of Cyberball for eliciting threats to interpersonal needs, a multivariate repeated-measures analysis of variance was conducted with measurement occasion (T_1, T_2, and T_3 Need-Threat) as a within-subjects factor (see Figure 1). The analysis yielded a significant main effect of measurement occasion, $F(2, 174) = 30.13$, $p < .001$. Pairwise comparisons revealed a significant difference between T_1 Need-Threat ($M = 2.25$, $SD = 0.08$) and T_2 Need-Threat ($M = 2.70$, $SD = 0.08$) scores, $p < .001$, as well as between T_2 Need-Threat and T_3 Need-Threat ($M = 2.18$, $SD = 0.07$) scores, $p < .001$, but not between T_1 Need-Threat and T_3 Need-Threat scores, $p = .193$).

Analytic Approach

Preliminary analyses examined the intercorrelations among study variables. Next, a series of hierarchical multiple regression analyses were conducted to

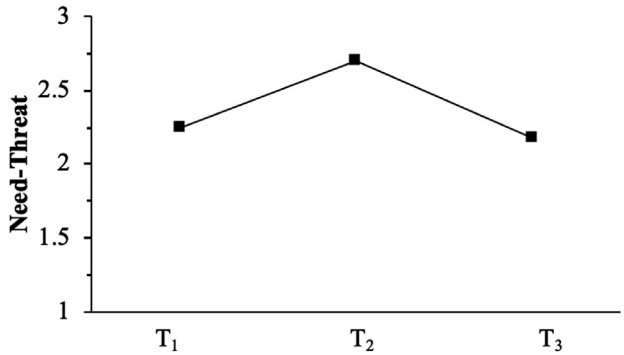

FIGURE 1 Pairwise comparison between T_1, T_2, and T_3 need-threat. *Note.* T_1 = Time 1 Need-Threat; T_2 = Time 2 Need-Threat; T_3 = Time 3 Need-Threat.

examine the independent and interactive contributions of lifetime and recent peer adversity to individual differences in each index of interpersonal needs (i.e., NTB, NFA_{app}, NFA_{avoid}, Need-Threat levels at T_1, T_2, T_3). Interpersonal needs were predicted from lifetime peer adversity (entered at the first step), recent peer adversity (entered at the second step), and their interaction (entered at the third step). Both predictors were standardized. The interaction of lifetime and recent peer adversity was computed as the product of the standardized predictors. Given the positive correlation between NFA_{app} and NFA_{avoid} and in line with prior research (e.g., Rudolph et al., 2005), analyses predicting one dimension of NFA (approach or avoidance) were adjusted for the alternate dimension. Analyses predicting T_2 and T_3 Need-Threat scores adjusted for previous assessments of need-threat. Significant interactions were decomposed using simple slope analyses. Interactions were interpreted by solving the unstandardized regression equation to predict interpersonal needs and situationally induced threats to needs from lifetime peer adversity at low (−1 SD) and high (+1 SD) levels of recent peer adversity (Bauer & Curran, 2005).

RESULTS

Preliminary Analyses

Table 1 displays intercorrelations among the variables. Consistent with prior research (Rudolph et al., 2005), NFA_{app} and NFA_{avoid} were significantly positively correlated. There was also a significant positive correlation between NTB and NFA_{app} and NFA_{avoid}. The three need-threat scores were significantly associated with each other, as well as with NTB and NFA_{avoid}. T_1 and T_3 Need-Threat were significantly negatively correlated with NFA_{app}. Lifetime peer adversity was significantly positively correlated with recent peer adversity. Both lifetime and recent peer adversity were significantly negatively correlated with NFA_{app} and positively correlated with NFA_{avoid} but were not significantly correlated with NTB. Lifetime and recent peer adversity were significantly associated with T_1 and T_3, but not T_2, Need-Threat scores.

Predicting Interpersonal Needs from Peer Adversity

Need to Belong. Inconsistent with Hypothesis 1, analyses examining NTB revealed nonsignificant main effects of lifetime peer adversity and recent peer adversity and a nonsignificant Lifetime Peer Adversity x Recent Peer Adversity interaction (see Table 2).

Approach NFA. Analyses examining NFA_{app} revealed a significant main effect of lifetime peer adversity, a significant main effect of recent peer adversity, and a significant Lifetime Peer Adversity × Recent Peer Adversity interaction (see Table 3). Decomposition of the interaction revealed that exposure to high levels of recent peer adversity suppressed NFA_{app} regardless of exposure to lifetime peer adversity (see Figure 2). These findings are consistent with our predictions that peer adversity would predict lower levels of NFA_{app} (Hypothesis 2) and that lifetime and recent peer adversity would contribute jointly to interpersonal needs (Hypothesis 4).

Avoidance NFA. Analyses examining NFA_{avoid} revealed a significant main effect of lifetime peer adversity at the first step, a significant main effect of recent peer adversity at the second step, and a nonsignificant Lifetime Peer Adversity × Recent Peer Adversity interaction at the third step (see Table 3). When recent peer adversity was added to the model, lifetime peer adversity was no longer a significant predictor. These findings are consistent with our predictions that peer adversity would predict higher levels of NFA_{avoid} (Hypothesis 1) and inconsistent with our prediction that lifetime and recent peer adversity would contribute jointly to interpersonal needs (Hypothesis 4).

Need-Threat. Analyses examining T_1 Need-Threat revealed significant main effects of lifetime peer adversity and recent peer adversity and a nonsignificant Lifetime Peer Adversity x Recent Peer Adversity interaction. As displayed in Table 2, exposure to lifetime peer adversity and recent peer adversity predicted greater threat to needs prior to Cyberball. Analyses examining T_2 Need-Threat revealed nonsignificant main effects of lifetime peer adversity and recent peer adversity and a nonsignificant Lifetime Peer Adversity × Recent Peer Adversity interaction (see Table 2). Analyses examining T_3 Need-Threat revealed a significant main effect of lifetime peer adversity, a nonsignificant main effect of recent peer adversity, and a nonsignificant Lifetime Peer Adversity × Recent Peer Adversity interaction (see Table 2). These findings are consistent with our prediction that lifetime peer adversity would predict greater threats to situation-specific interpersonal needs (Hypothesis 3).

TABLE 2
Predicting NTB and Need-Threat from Lifetime Peer Adversity, Recent Peer Adversity, and Lifetime Peer Adversity × Recent Peer Adversity Interaction

	Predictors	*NTB*			*T_1 Need-Threat*			*T_2 Need-Threat*			*T_3 Need-Threat*		
		β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2
Step 1.	Lifetime peer adversity	−.01	−.12	.00	.33	3.26**	.11	−.12	−1.26	.01	.18	2.45*	.03
Step 2.	Lifetime peer adversity	−.08	−.64		.12	1.10		−.13	−1.19		.16	2.01*	
	Recent peer adversity	.13	1.03	.01	.40	3.53**	.11	−.02	.16	.00	.03	.40	.00
Step 3.	Lifetime peer adversity	−.11	−.80		.09	.78		−.16	−1.39		.18	2.15*	
	Recent peer adversity	.12	.94		.38	3.37**		.01	.09		.04	.45	
	Lifetime peer adversity X Recent peer adversity	.08	.68	.04	.11	1.08	.01	.09	.91	.00	−.06	−.78	.00

Note. NTB = Need to belong; T_1 = Time 1 Need-Threat; T_2 = Time 2 Need-Threat; T_3 = Time 3 Need-Threat; Regressions for Need-Threat adjusted for need-threat at previous time points as relevant.
*$p < .05$; **$p < .01$.

TABLE 3
Predicting NFA_{app} and NFA_{avoid} From Lifetime Peer Adversity, Recent Peer Adversity, and Lifetime Adversity X Recent Adversity Interaction

	Predictor	*NFA_{app}*			*NFA_{avoid}*		
		β	t	ΔR^2	β	t	ΔR^2
Step 1.	Alternative NFA	.58	6.65**	.34	.58	6.65**	.34
Step 2.	Alternative NFA	.60	7.02**		.61	7.02**	
	Lifetime adversity	−.21	−2.45*	.04	.18	2.10*	.03
Step 3.	Alternative NFA	.66	7.45**		.60	7.45**	
	Lifetime adversity	−.10	−1.02		−.00	−.04	
	Recent adversity (Chronic)	−.22	−2.10*	.03	.35	3.76**	.09
Step 4.	Alternative NFA	.65	7.56**		.62	7.56**	
	Lifetime adversity	−.16	−1.63		.03	.32	
	Recent adversity (Chronic)	−.24	−2.38*		.37	3.89**	
	Lifetime adversity × Recent adversity (Chronic)	.20	2.24*	.03	-.11	-1.19	.01

Note. NTB = Need to belong; NFA_{avoid} = Avoidance need for approval; NFA_{app} = Approach need for approval; Regressions adjusted for alternative dimension of NFA.
*$p < .05$; **$p < .01$.

DISCUSSION

Despite evidence for individual differences in interpersonal needs and their socioemotional consequences (Pickett et al., 2004; Tyler et al., 2016), little is known about their origins. The present study examined whether lifetime and recent peer adversity individually or jointly contribute to the intensity of both general and situation-specific needs in adolescent girls. We found support for both individual and joint effects of lifetime and recent peer adversity on NFA. Although neither lifetime nor recent peer adversity predicted individual differences in general NTB, both predicted threats to situation-specific belonging needs. These findings indicate that exposure to peer adversity has important implications for both general and situation-specific interpersonal needs in adolescent girls.

Approach and Avoidance NFA

Consistent with theory and prior research (Rudolph, 2021), exposure to adverse peer experiences predicted the strength of NFA. Specifically, both lifetime and recent peer adversity predicted higher levels of NFA_{avoid}. However, recent peer adversity seemed to largely account for this effect, as lifetime peer adversity was no longer a significant predictor after recent peer adversity was taken into account. This pattern of findings suggests that, regardless of lifetime experiences of peer adversity,

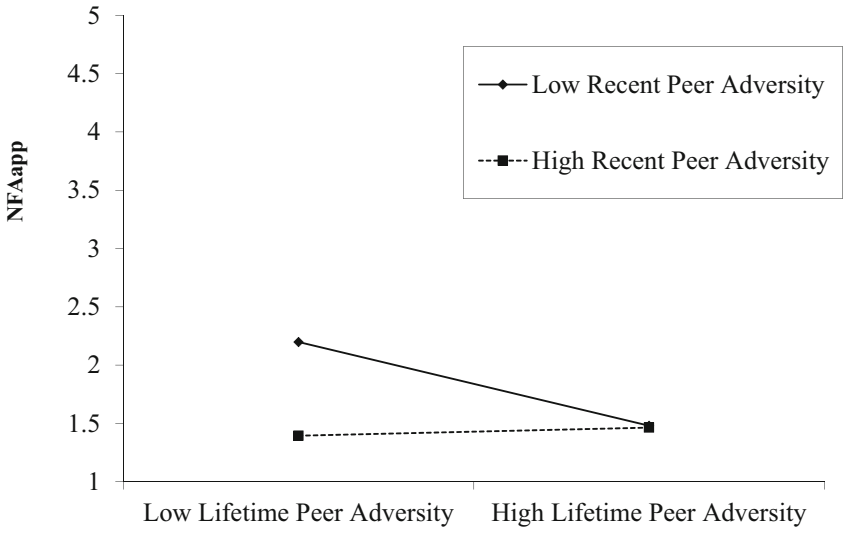

FIGURE 2 Lifetime peer adversity × recent peer adversity interaction in the Prediction of NFA_{app} *Note*. NFA_{app} = Approach need for approval; NFA_{app} adjusts for avoidance NFA (NFA_{avoid}).

recent peer adversity may incline adolescent girls toward heightened sensitivity to negative judgments from their peers, such that they experience low self-worth in the face of peer disapproval. Alternatively, it is possible that lifetime peer adversity predicts later peer adversity, which accounts for the association between earlier peer adversity and NFA_{avoid}. Indeed, youth with a history of peer adversity are especially susceptible to future adverse peer experiences (Salmivalli & Isaacs, 2005), suggesting the viability of this mediational path.

Additionally, the interaction between lifetime and recent peer adversity predicted NFA_{app}. Specifically, recent peer adversity suppressed NFA_{app} even when girls had been exposed to low levels of prior peer adversity. Thus, girls encountering high levels of recent peer adversity may be less inclined toward enhanced self-worth in the context of peer approval or acceptance, perhaps finding it difficult to integrate this positive feedback into an already depleted sense of self. Consistent with self-verification theory, it is possible that girls exposed to peer adversity are not prone to enriched self-worth, instead seeking feedback from others that is consistent with their own negative self-views (Swann, 2012).

Recent longitudinal work highlights not only that exposure to peer adversity (e.g., peer victimization) leads to subsequent increases in NFA_{avoid} and decreases in NFA_{app}, but also that NFA_{avoid} predicts within-person increases in peer adversity over time (Xu et al., 2020). Individual differences in NFA following peer adversity may, in turn, contribute to future social and emotional maladjustment. As a heightened need to avoid negative peer judgments is reinforced through exposure to peer adversity, adolescents may be at risk for self-doubt, worry, and emotional distress (Rudolph et al., 2005). Additionally, girls may become less likely to act in a prosocial manner given lower levels of NFA_{app} and higher levels of NFA_{avoid} (Rudolph & Bohn, 2014). Whereas motivation to gain approval predicts more positive engagement, as well as less conflictual engagement and disengagement (Rudolph & Bohn, 2014), and buffers against emotional distress (Rudolph et al., 2005), motivation to avoid disapproval predicts the opposite pattern of adjustment. Additionally, when youth experience unmet belongingness needs through social exclusion or low levels of inclusion in everyday school settings, resulting feelings of loneliness are associated with lower subjective well-being and greater mental health problems (Arslan, 2020).

Taken together, heightened NFA_{avoid} and suppressed NFA_{app} associated with peer adversity suggests that these interpersonal needs may be an important target for future interventions aimed at reducing risk for impaired social competence and heightened emotional distress in peer adversity-exposed adolescent girls. Peer experiences exert a powerful influence on self-appraisals in childhood and adolescence (Harter, 1998). By altering how girls determine and judge their self-worth following peer adversity, it may be possible to disrupt a trajectory toward such maladaptive outcomes.

Interventions following peer adversity may be aimed at teaching girls to incorporate other factors such as individual strengths (e.g., positive personality traits) into self-appraisals instead of relying heavily on judgments of peers. Alternatively, interventions could capitalize on existing individual differences that might interact with interpersonal needs to influence outcomes. For example, the impact of approach and avoidance tendencies may differ depending on youth's level of self-control, resulting in trade-offs of NFA_{app} and NFA_{avoid} for adjustment (Rudolph, Troop-Gordon, & Llewellyn, 2013). Interventions could potentially be aimed at improving self- regulatory skills in ways that maximize the benefits and minimize the cost of heightened social motivation. Additionally, more general prevention-based interventions may focus on simply improving social competence and relationships with peers following peer adversity. Prevention work in early adolescence has demonstrated that programs focused on problem solving and social skills with peers are effective at improving social competence (LeCroy & Rose, 1986). By fostering healthy relationships with peers through such programs, the deleterious effects of peer adversity on self-appraisals may be diminished, setting adolescent girls on a trajectory toward improved subjective self-worth and future social competence.

General and Situation-Specific NTB

Neither lifetime nor recent peer adversity were significantly associated with general NTB. Consistent with previous research (Rudolph et al., 2016), however, exposure to peer adversity predicted threats to situation-specific interpersonal needs (including belongingness) following Cyberball. Both lifetime and recent peer adversity predicted threatened needs prior to the laboratory manipulation of social exclusion (T_1 Need-Threat), aligning with the idea that exposure to recent stressors adds to the unfavorable effects of earlier adversity (O'Connor, 2003). This finding is also consistent with the proposed mechanisms of the SMS (Gardner et al., 2000; Pickett et al., 2004), as long-term exposure to peer adversity is thought to cause heightened social hunger due to consistent threats to social acceptance. As a result, girls previously exposed to peer adversity may feel as though their needs are continuously threatened. Neither lifetime nor recent peer adversity predicted situation-specific interpersonal needs during Cyberball (T_2 Need-Threat). Previous research demonstrates that exclusion during Cyberball results in threatened levels of belonging needs in most adolescents over a short period of time (van Beest & Williams, 2006; Hartgerink et al., 2015), as it did in the present study. These feelings of threat appear to occur regardless of past exposure to peer adversity, perhaps reflecting a universal need to belong and immediate consequences when this need is threatened. However, approximately 35 min after Cyberball (T_3 Need-Threat), the effects of the situationally induced rejection are expected to have dissipated for many youth (Hartgerink et al., 2015), as they did in this study. After this delay, lifetime, but not recent peer adversity, predicted higher need-threat scores, suggesting that lifetime peer adversity contributes to a more lasting threat to belongingness needs in the context of adverse social cues such as exclusion.

Prominent theories regarding the SMS suggest that long-term peer adversity may recalibrate this system, making it difficult for interpersonal needs to return to a point of equilibrium (Gardner et al., 2000). Our pattern of findings for situation-specific belongingness supports the notion that lifetime peer adversity may alter the functioning of the SMS (Gardner et al., 2000; Pickett et al., 2004). After the effects of Cyberball dissipated in many youth, adolescent girls who had experienced higher levels of lifetime peer adversity continued to show threats to their interpersonal needs. Because chronic peer adversity "starves" individuals of social acceptance for extended periods, it may lead to heightened social hunger and associated adverse effects compared to recent peer adversity (Gardner et al., 2000; Pickett et al., 2004). Although Cyberball is an ecologically valid, but relatively mild stressor (Hartgerink et al., 2015), it is worth acknowledging that more extreme instances of peer adversity encountered in everyday life (e.g., physical victimization) may have effects that linger for hours or days, compromising interpersonal needs for extended periods of time. In these real-world scenarios, it is possible that exposure to recent peer adversity would also predict lingering threats to interpersonal needs.

The lack of an expected significant association between peer adversity and general NTB in the current study highlights potential differences between belongingness needs assessed generally (e.g.,. "I want other people to accept me"), and those assessed in the present moment (e.g., "I feel rejected"). It is possible that peer adversity is connected to moment-to-moment feelings of belongingness but the connection to general NTB is contingent on other individual differences that were not examined in this study, such as how well

individuals cope with experiences of peer adversity. More research is needed to determine whether peer adversity might compromise general NTB in some individuals or under certain circumstances.

Contributions, Limitations, and Future Directions

Despite theoretical notions that long-term experiences of peer adversity may alter the SMS, this system has been studied predominantly in the short term (i.e., immediate changes following manipulations in the laboratory; Gardner et al., 2000; Pickett et al., 2004). Thus, less is known about how it may adapt and change over time as a result of peer experiences in everyday life. The current study is among the first to demonstrate that peer adversity serves as an antecedent to potentially unfavorable individual differences in interpersonal needs, adding to a growing list of adverse social consequences of peer adversity. In particular, findings supported the idea that both lifetime and recent peer adversity (either alone or in combination) both make an important contribution to interpersonal needs in adolescent girls.

Overall, this work was grounded in a strong theoretical rationale (Gardner et al., 2005; Rudolph, 2021) and focused on a developmental period during which peer interactions are particularly salient and peer approval plays an influential role in self-worth (Harter, 1998; Harter et al., 1998), thus providing an important first step toward understanding the lasting implications of peer adversity for interpersonal needs during adolescence. Collectively, the current findings and previous research regarding outcomes associated with individual differences in interpersonal needs suggest that these needs may be a mechanism of interest following peer adversity.

Given that the present study was limited by retrospective assessments of peer adversity and few time points, future research would benefit from a longitudinal approach with multiple assessments in order to examine the manner in which peer adversity and interpersonal needs change over time. The SMS is not a static system, but rather changes in response to the social environment to provide adaptive benefits to individuals (Gardner et al., 2005). Future longitudinal research would be helpful to provide insight into the dynamic and reciprocal associations among peer adversity, interpersonal needs, and socioemotional adjustment over time. Although one paper to date has taken this longitudinal approach, only victimization and NFA were examined (Xu et al., 2020), leaving ample opportunity for future research to incorporate other forms of adversity, interpersonal needs, and outcomes of interest.

Future work would also benefit from examining potential moderators of the association between peer adversity and interpersonal needs. As the current work was limited due to its focus on adolescent girls, our findings are not widely generalizable. Additional research incorporating adolescent boys and an examination of potential gender differences is warranted. Given that boys recall less social aggression and report less negative feelings after peer stress (Paquette & Underwood, 1999), it is likely that exposure to peer adversity will have different effects on interpersonal needs for boys than for girls. The incorporation of both boys and girls in future work will provide a more comprehensive understanding of how interpersonal needs are impacted by peer adversity. Further, a large portion of the current sample, based in the U.S., was White. Future work would benefit from an understanding of how peer adversity impacts interpersonal needs in other cultures and racial/ethnic groups, given cultural differences in social norms and values for minority youth (Rubin, Bukowski, & Parker, 2006).

The manner in which girls cope with peer adversity may moderate the association between such experiences and interpersonal needs. For example, youth with adaptive coping skills may not be as heavily impacted by peer adversity as youth with maladaptive coping skills. Better coping abilities may protect youth against declines in self-appraisals and self-worth following peer adversity. Thus, self-regulation may also be of importance to assess when examining interpersonal needs following peer adversity. Given that emotion dysregulation following peer adversity has been associated with poor outcomes, such as internalizing symptoms (McLaughlin, Hatzenbuehler, & Hilt, 2009), and inhibitory control has been shown to interact with interpersonal needs to influence outcomes (Rudolph et al., 2013), future work aimed at understanding the role of self-regulation following peer adversity could inform efforts aimed at improving youth's self-worth, as well as emotional well-being. Taken together, the incorporation of both longitudinal investigations and potential moderators in future work may provide important insights.

CONCLUSIONS

This study is among the first to demonstrate that peer adversity serves as an antecedent to

individual differences in interpersonal needs. Our pattern of findings highlights the importance of examining both separate and joint contributions of lifetime and recent peer adversity to both general and situation-specific interpersonal needs. Given that peer adversity appears to lead to potentially unfavorable individual differences, this work makes the novel contribution of highlighting interpersonal needs as a point of intervention following peer adversity.

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