

Within- and Between-Person Loneliness and Self-Esteem During Emerging Adulthood: The Moderating Role of Emotion Regulation Difficulties

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Abstract

Emerging adulthood brings concerns about sense of self and belonging to the forefront, a period during which many young adults experience loneliness and mental health challenges. Self-esteem, or one's evaluation of self-worth, may both predict and/or be predicted by loneliness, though longitudinal research is needed to disentangle the nature of these associations. Therefore, the link between loneliness and self-esteem was examined while considering the moderating role of emotion regulation difficulties. Participants ($N = 1,217$, $M_{age} = 18.14$, 71% female-identifying) completed a survey at three timepoints over one year. Random-intercept cross-lagged panel modelling indicated a bidirectional within-person association between increases in loneliness and decreases in self-esteem. Emotion regulation difficulties did not moderate the association, though it was associated with both loneliness and self-esteem. These findings suggest that during emerging adulthood, loneliness may hinder self-esteem which is likely to lead to further loneliness.

Keywords

loneliness, self-esteem, emotion regulation, emerging adulthood

Emerging adulthood involves shifts in social networks (e.g., leaving home to attend college) that not only create opportunities for new social connections but also increase risks for social isolation and loneliness (Arnett et al., 2014). Loneliness has become increasingly prevalent among emerging adults (aged 18-25 years) (Buecker et al., 2021), with rates comparable to those aged 65 and older, who often report the highest level of loneliness (Hawkley et al., 2022; Luhmann & Hawkley, 2016). Young adults who experience loneliness are at greater risk for a variety of aversive mental health outcomes, including depression and anxiety (Danneel et al., 2020; Erzen & Çikrikci, 2018). Loneliness may also undermine self-esteem, and low self-esteem in turn may heighten vulnerability to loneliness, though the nature of this reciprocal association remains unclear (Spithoven et al., 2017). As self-exploration and identity development are central developmental tasks during the period of emerging adulthood (Arnett et al., 2014), examining how loneliness and self-esteem are linked would offer important insights for intervention efforts aimed at alleviating loneliness and supporting self-esteem among emerging adults. Thus, the association between loneliness and self-esteem was examined in this study, with emotion regulation considered as a moderator given that

difficulties in managing negative emotions may intensify feelings of loneliness (Kang et al., 2025).

Loneliness

Loneliness is a negative feeling that arises from a perceived discrepancy between desired and actual interpersonal relationships, such as having fewer close relationships than one would like (de Jong Gierveld et al., 2018; Peplau & Perlman, 1982). According to the evolutionary model of loneliness (Cacioppo et al., 2006), loneliness functions as a signal of potential social isolation, motivating individuals to reconnect with others in efforts to alleviate the negative feelings. Further, loneliness can heighten negative cognitive biases, such as

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negative evaluations of the self and others, increased sensitivity to social threats, anticipation of rejection, and hostile intent attributions (Spithoven et al., 2017). These cognitive biases may prompt socially awkward behaviors that elicit negative responses from others, or social-distancing behaviors to protect one's own interests and welfare, creating a self-reinforcing cycle of loneliness (Cacioppo & Cacioppo, 2018; Spithoven et al., 2017).

Of the various negative cognitive biases associated with loneliness, negative self-evaluation may be particularly detrimental during emerging adulthood, a period when individuals are actively constructing their identities. This developmental stage is marked by a sense of "in-betweenness" (i.e., neither an adolescent or an adult), heightened instability, and a range of new opportunities and challenges (Arnett et al., 2014), which may increase the risk of social isolation and loneliness. Given that identity development is embedded in social context (Crocetti et al., 2018), feelings of loneliness may significantly influence how emerging adults perceive and evaluate themselves. The reflected appraisals theory also indicates that individuals' self-perceptions are shaped by their beliefs of how others view them (Harter, 1999; Mead, 1967).

Self-esteem refers to an individual's subjective evaluation of their worth (Rosenberg, 1965). As a psychological resource, self-esteem is thought to protect individuals against negative outcomes, such as poor well-being, internalizing symptoms, and peer victimization based on previous meta-analyses (Mullan et al., 2023; Zell & Johansson, 2025). Conversely, low self-esteem, reflecting negative self-evaluation, may both result from and contribute to loneliness (Geukens et al., 2022; Spithoven et al., 2017). For example, individuals with low self-esteem may be less likely to seek out social connection or engage in socially awkward behaviors, as they often anticipate rejection or perceive themselves as unworthy, which in turn, may lead to poor social connections and result in loneliness. In contrast, those with higher self-esteem may be more likely to connect with others due to more positive self-evaluation, and thus, be at lower risk of loneliness. These assumptions align with the self-broadcasting perspective (Srivastava & Beer, 2005) suggesting that individuals "broadcast" their self-evaluations in their social behaviors, which in turn, shape the quality of social relationships. They are also supported by previous meta-analysis that demonstrated a reciprocal association between the quality of social relationships and self-esteem (Harris & Orth, 2020).

Empirical evidence on the bidirectional association between loneliness and self-esteem is limited (see Buecker et al., 2024 for a review). For example, although a reciprocal association has been found among adolescents (Geukens et al., 2022), studies examining within-person changes in emerging adults have only demonstrated a link between within-person increases in loneliness and within-person decreases in self-esteem over time, but not vice versa (Ti et al., 2022). These contrasting findings highlight a need to clarify the

directionality of association, especially during the period of emerging adulthood when loneliness is prevalent due to heightened social instability (Buecker et al., 2021), and when the appraisal of one's worth and capabilities is linked to the formation of identity, a core developmental task (Arnett et al., 2014; Vignoles et al., 2006). The lifespan perspective on loneliness (Hawkley et al., 2022; Luhmann & Hawkley, 2016) also indicates that factors driving loneliness may differ at different ages, such that social transitions that deviate from age-normative expectations (e.g., moving away from home at senior high school) or age-specific experiences (e.g., having no friends during adolescence) may have more profound implications for loneliness.

Emotion Regulation as a Moderator

Given the potential self-reinforcing loneliness loop, identifying factors that may mitigate or exacerbate the risk is crucial to informing interventions. One such factor is emotion regulation, as loneliness is accompanied by negative emotions due to perceived unmet social needs (Patrichi et al., 2025). From this perspective, an emotion regulation framework may provide valuable insights into understanding loneliness (Preece et al., 2021). Emotion regulation refers to attempts to manage the intensity, duration and expression of emotions (Gross, 2015). Unlike coping, which specifically addresses a stressor, emotion regulation may occur in non-stressful situations, such as managing emotions evoked by a touching movie scene or a joyful event (Compas et al., 2017). Previous research suggests that individuals experiencing higher levels of loneliness often rely on unhealthy regulation strategies, such as expressive suppression, rumination, and catastrophizing (O'Day et al., 2019; Preece et al., 2021). Moreover, adolescents who are chronically lonely tend to report greater use of catastrophizing, self-blame, and rumination compared to those on a different developmental trajectory (Vanhalst et al., 2018). This line of research supports the relevance of emotion regulation in understanding loneliness.

Emotion regulation may moderate the association between loneliness and self-esteem. For example, the Social Baseline Theory (SBT) (Coan & Sbarra, 2015) suggests that social connections support the regulation of emotions, such as through load sharing or the distribution of emotional and psychological stress. When these social resources are absent or perceived as lacking, individuals would be at heightened risks for emotional distress and physiological strain (Holt-Lunstad, 2021). Given this perspective, individuals with poor emotion regulation skills may be particularly vulnerable to the negative effects of loneliness, as they have poor internal resources (e.g., self-regulatory) and perceive a lack of external resources (e.g., social connections) to manage distress. Conversely, individuals with strong emotion regulation capacities may be less susceptible to the detrimental effects of loneliness.

Therefore, in line with the SBT (Coan & Sbarra, 2015), poor emotion regulation skills may exacerbate the negative implications of loneliness on self-esteem. This speculation is supported by previous research. For example, a study involving veterans and ex-prisoners of war demonstrated a stronger association between loneliness and depression during COVID-19 among those who had a greater tendency to suppress their emotions (Kaplan et al., 2023). Another study examining depressive symptoms in young adults revealed a significant interaction between emotion regulation and social connectedness (a related but distinct construct of loneliness), wherein socially connected individuals with greater emotion regulation skills unexpectedly reported higher levels of depressive symptoms over time (Marroquín et al., 2019). These findings suggest that emotion regulation may moderate the role of loneliness on self-esteem.

Similarly, emotion regulation is linked to self-esteem and may moderate its role on loneliness. Previous research indicates that emotional capacities, such as emotional intelligence, emotional awareness, and knowledge of emotional regulation strategies, play an integral role in shaping self-esteem among young adults (Cheung et al., 2015; Fasciano et al., 2021). Additionally, self-esteem has implications for the selection of emotion regulation strategies (Shafir et al., 2017), though findings have been inconsistent (Mouatsou & Koutra, 2023). Emotion regulation may also moderate the effects of self-esteem on loneliness, as implicated by resilience models such as the protective factor model (Masten et al., 2021) suggesting that risk and protective factors may interact to predict psychological adjustment. For example, individuals with low self-esteem might be less lonely if they had stronger emotion regulation skills. Although research supporting this assumption is limited, emotion regulation has been found to moderate the association between self-concept clarity and depression, in which individuals with low self-concept clarity reported fewer depressive symptoms if they had higher emotion regulation skills (Hong et al., 2022). Given that self-esteem and self-concept clarity are integral aspects of self that co-develop over time (Weber et al., 2023), self-esteem may also interact with emotion regulation to predict loneliness.

The Present Study

Emerging adulthood is a period of major social changes, where shifting relationships and new roles can heighten concerns about belonging and self-esteem. During this period, emerging adults may experience elevated levels of loneliness. While prior research suggests a link between loneliness and self-esteem, the directionality of association remains unclear. Moreover, little is known about the role of emotion regulation in shaping these associations, despite its links with both loneliness and self-esteem. Therefore, the directionality of association between loneliness and self-esteem was examined in this study, while considering the moderating role of emotion regulation. Based on previous literature, a bidirectional and

negative association was expected between loneliness and self-esteem. Emotion regulation difficulties were expected to strengthen the negative association between loneliness and self-esteem. Gender was considered as a covariate due to potential gender differences in loneliness (Barreto et al., 2021; Maes et al., 2022), self-esteem (Bleidorn et al., 2016), and emotion regulation (Nolen-Hoeksema, 2012).

Building on prior research that has focused primarily on between-person differences (see Kirwan et al., 2024 for a review), within- and between-person differences were both examined in this study. Differentiating between within-person and between-person differences is crucial because loneliness (Shrestha et al., 2024) and self-esteem fluctuate within individuals over time (Mahadevan et al., 2020). Additionally, associations observed at the between-person level may not necessarily hold at the within-person level, as they may differ in the magnitude or directionality of associations (Hamaker et al., 2015). By capturing both within- and between-person dynamics, findings of the present study would clarify not only who is most at risk, but also *when* individuals are vulnerable, offering important insights for intervention efforts.

Methods

Participants

Participants were part of a larger study that examined stress and coping among emerging adults transitioning to university in Toronto, Canada. Participants included 1,217 first year undergraduate students aged between 17-25 years ($M_{age} = 18.14$, $SD = 0.95$). The majority of participants identified as females (71%), 25% identified as male, and 3% as a non-binary gender identity. At least 60% of participants had parents with a university degree or higher. Participants were of diverse ethnic backgrounds (including mixed ethnicities), with the majority being White (21%), South Asian (22.3%), East Asian (35.9%). Other ethnic backgrounds included Latin American/Hispanic, Black, Arab/West Asian, South East Asian, Filipino, West Indian, Aboriginal, and 3.1% provided a different descriptor in a free response option.

Procedure

Participants were recruited from a large University in Toronto, Canada, through campus posters, electronic advertisements (e.g., student club list serves), and classroom announcements. Interested individuals contacted the lab to confirm eligibility (i.e., first-year undergraduate student residing in the surrounding area of the university). Each participant was assigned a unique identification code. Participants completed three surveys (40-min each) over the course of one year, spaced three months apart. As a token of appreciation, participants received electronic gift cards (e.g., Amazon) valued at \$15 at T1, \$20 at T2, and \$25 at T3.

Ethics approval was obtained from the University Ethics Board. Participants provided informed consent before each survey. To minimize potential discomfort, participants had the option to skip survey questions without penalty, access local mental health resources and supports by clicking on a “Feeling Distressed” button, and withdraw from the study at any time. Additionally, participants were asked to reflect on a positive event from the previous day after completing each survey, a practice demonstrated to improve mood (Seligman et al., 2005). Moreover, they were given a list of local mental health resources and support services, as well as a debriefing form.

Measures

Loneliness. Loneliness was measured by the widely used UCLA Loneliness Scale-Short Form (Hays & DiMatteo, 1987). The ULS-8 consists of 8 items (e.g., “I lack companionship”) rated on a scale ranging from 1 = *I never feel this way* to 4 = *I often feel this way*. Two items were reverse-coded, including “I am an outgoing person” and “I can find companionship when I want it.” Items were averaged and a higher score indicated higher levels of loneliness. The ULS-8 has good reliability and validity (Xu et al., 2018). In this study, reliability across timepoints was good, $\alpha_{T1} = .84$, $\alpha_{T2} = .84$, $\alpha_{T3} = .85$.

Self-Esteem. Self-esteem was measured using the Rosenberg Self-Esteem Scale (Rosenberg, 1965). The RSES evaluates global self-worth with five positively worded items (e.g., “I feel that I’m a person of worth”) and five negatively worded items (e.g., “At times I think I am no good at all”) rated on a 4-point scale indicating different levels of agreement. All negatively worded items were reverse-scored. A higher averaged score indicated higher self-esteem. The RSES has strong psychometric properties across different demographics (Schmitt & Allik, 2005). Reliability was good across timepoints in this study, $\alpha_{T1} = .88$, $\alpha_{T2} = .88$, $\alpha_{T3} = .88$ LMI.

Emotion Regulation Difficulties. Emotion regulation difficulties were measured using the Difficulties in Emotion Regulation Scale – Short Form (DERS-SF) (Kaufman et al., 2016). The DERS-SF includes 18 items, capturing six facets of emotion regulation difficulties: nonacceptance of emotional responses, limited access to emotion regulation strategies, impulse control difficulties, difficulties engaging in goal-directed behavior, lack of emotional awareness, and lack of emotional clarity. Each item (e.g., “I have no idea how I am feeling”) was rated on a scale ranging from 1 (*almost never*, 0%–10%) to 5 (*almost always*, 91%–100%). Items of lack of emotional awareness were reversed scored. A higher averaged score indicated greater emotion regulation difficulties. The DERS-SF has demonstrated reliability and validity across adolescent and adult populations; its psychometric properties are also comparable to the original long version (Hallion et al., 2018;

Kaufman et al., 2016). Internal consistency in this study was excellent across time-points $\alpha_{T1} = .90$, $\alpha_{T2} = .90$, $\alpha_{T3} = .90$.

Missing Data

Participant retention rate was quite strong, with 78.5% completing all three waves, 13% completing two waves, and 8.6% completing only one wave. Younger individuals and those identifying as females were more inclined to complete multiple waves. Missingness within waves seemed to be completely at random as Little’s MCAR test was not significant for the key variables (T1-T3), $\chi^2(90) = 97.61$, $p = .27$. Moreover, no systematic pattern of missingness was evident on the key variables between participants who completed only one wave and those who completed two or all waves based on Multivariate Analysis of Variance (MANOVA). Given that missingness seems to be at random, missing data was handled using full information maximum likelihood (FIML).

Analytical Plan

Preliminary analyses were conducted with SPSS 25. All modelling analyses were conducted with Mplus 8.10 (Muthén & Muthén, 1998–2022). To determine whether key constructs were comparable across timepoints, longitudinal measurement invariance (LMI) was first examined (see [supplementary material](#)). Additionally, intraclass correlations (ICCs) were examined to determine the proportion of between-person variance relative to the total variance. To distinguish between within-person and between-person differences in the temporal and concurrent associations among loneliness, self-esteem, and emotion regulation difficulties, the random-intercept cross-lagged panel modelling (RI-CLPM) approach was adopted (Hamaker et al., 2015). The RI-CLPM approach differs from the traditional cross-lagged panel modelling (CLPM) approach by separating stable trait-like characteristics (i.e., between-person) and within-person fluctuations. The between-person component represents variance due to stable individual differences, modeled through a random intercept (i.e., a latent variable with repeated measures as indicators and factor loadings fixed to 1). The within-person variance captures individual fluctuations relative to expected scores across measurement waves.

Following previous recommendations (Speyer et al., 2023), random intercepts (between-person) were estimated for loneliness and self-esteem, along with within-person cross-lagged and concurrent associations. Gender was accounted for as a time-invariant covariate predicting all observed variables within each wave. Those identifying as other genders (e.g., non-binary) were excluded from all RI-CLPM analyses due to the limited sample size (less than 5%); however, descriptive statistics for this group are presented in [Table 1](#). As moderation analyses using RI-CLPM is highly computationally demanding, the Bayesian estimation was used. The Bayesian estimation uses both the data and prior distributions about the

Table 1. Descriptive Statistics and Correlations

	1	2	3	4	5	6	7	8	9	10
1. Loneliness T1	--									
2. Self-esteem T1	-.54***	--								
3. Emotion regulation difficulties T1	.47***	-.61***	--							
4. Loneliness T2	.71***	-.47***	.40***	--						
5. Self-esteem T2	-.46***	.77***	-.54***	-.55***	--					
6. Emotion regulation difficulties T2	.37***	-.50***	.71***	.47***	-.61***	--				
7. Loneliness T3	.65***	-.43***	.38***	.72***	-.49***	.47***	--			
8. Self-esteem T3	-.44***	.72***	-.51***	-.51***	.79***	-.57***	-.55***	--		
9. Emotion regulation difficulties T3	.36***	-.48***	.65***	.42***	-.55***	.74***	.49***	-.59***	--	
10. Gender	.11***	-.18***	.11***	.11***	-.18***	.13***	.09**	-.14***	.13**	--
Mean (males & females-identifying)	2.41	2.65	2.55	2.40	2.62	2.61	2.38	2.64	2.54	--
SD (males & females-identifying)	0.67	0.56	0.74	0.66	0.55	0.73	0.66	0.55	0.72	--
Mean (non-binary & other genders)	2.76	2.12	3.15	22.78	2.27	3.06	2.65	2.29	2.89	--
SD (non-binary & other genders)	0.57	0.47	0.74	0.54	0.47	0.65	0.58	0.45	0.57	--

Note. * $p < .05$. ** $p < .01$. *** $p < .001$.

unknown parameters to calculate the posterior distributions or their most likely values (Speyer et al., 2023). The final estimates for each parameter are usually taken as the mean or median of these posterior distributions (van Ravenzwaaj et al., 2018). The significance of regression slopes and effect sizes are evaluated using the credible intervals, showing a 95% probability that the true parameter value falls within the interval based on the observed data (Speyer et al., 2023).

Model fit was assessed using the comparative fit index (CFI), the root-mean-square error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR). CFI values $\geq .90$, RMSEA $\leq .08$, and SRMR $\leq .08$ would indicate adequate model fit (Byrne, 2013). Additionally, the robustness of the Bayesian estimation was evaluated using the criterion of potential scale reduction (PSR) values < 1.1 (Speyer et al., 2023). Once convergence was achieved, the number of iterations was doubled to ensure stable convergence of PSR < 1.1 . This was done to assess relative bias, as represented by parameter estimates between a model based on first convergence and a model based on doubled iterations, with a difference $< 10\%$ indicating little relative bias (McNeish, 2016; Speyer et al., 2023).

A baseline model with loneliness, self-esteem, and emotion regulation difficulties was examined first, controlling for gender. In subsequent models, the moderating role of emotion regulation difficulties was considered at both within-person and between-person levels to offer insights into both within-person and between-person moderation effects. Between-person level moderating effects were treated as a time-invariant factor by averaging T1-T3 scores across timepoints. In each moderation model, an interaction term was specified using the XWITH command (Speyer et al., 2023). For example, an interaction term was specified for the interaction between within-person loneliness (T1) and within-(between-) person emotion regulation difficulties (T1) and used as a predictor of within-person self-

esteem (T2). All autoregressive, cross-lagged, and moderation paths were constrained to be equal to maintain model parsimony. Standard model fits indices are not available when latent interaction variables are specified in *Mplus*; these indices are also unlikely to change substantially compared to the baseline model due to the added interaction parameters (Speyer et al., 2023).

No informative priors were specified in the present study. On default, then, *Mplus* allows the data to dominate the posterior, resulting in results that would closely resemble those of standard maximum likelihood estimation (Asparouhov & Muthén, 2010). Relatedly, missing data are treated as additional unknown parameters, and are sampled from their conditional posterior distribution (McNeish & Hamaker, 2020).

Results

Descriptives and correlational analyses are presented in Table 1. In general, loneliness was negatively associated with self-esteem, but positively associated with emotion regulation difficulties. Self-esteem was negatively associated with emotion regulation difficulties. ICC analyses indicated that approximately 69%-76% of variances were due to between-person differences, suggesting variability due to within-person fluctuations. All examined constructs demonstrated longitudinal measurement invariance (see supplementary material). Model fits were good for emotion regulation difficulties and acceptable for loneliness and self-esteem based on at least one of the model fit indices.

Baseline Model

The model with loneliness, self-esteem, and emotion regulation difficulties had excellent fit, CFI = 1.00, 90% CI [.99, 1.00], RMSEA = .00, 90% CrI [.00, .03]. PSR values were

below 1.1 with relatively low bias. At the between-person level (see Table 2), individuals with lower self-esteem and greater emotion regulation difficulties reported higher levels of loneliness. Additionally, those with greater emotion regulation difficulties tended to report lower self-esteem relative to those with fewer emotion regulation difficulties. Similar patterns were observed at the within-person level. At times when individuals felt lonelier, they also viewed themselves less positively and experienced greater emotion regulation difficulties compared to their typical levels. Further, at times when individuals had emotion regulation difficulties greater than their typical levels, they also tended to have a poorer sense of self compared to typical levels. Significant autoregressive paths were evident for all variables (see Table 2). Over time, a bidirectional association was observed between

loneliness and self-worth, wherein within-person increases in loneliness predicted within-person decreases in self-esteem, and vice versa. Within-person increases in emotion regulation difficulties predicted within-person decreases in self-esteem and increases in loneliness.

Moderating Effects

To examine the moderating role of emotion regulation difficulties, four additional models were considered. In these models, gender was not controlled for to allow reasonable computational time and facilitate model convergence. In the first moderation model, an interaction term was created between within-person emotion regulation difficulties (T1-T2) and within-person loneliness (T1-T2) predicting within-

Table 2. Summary of Baseline RI-CLPM Model With Unstandardized Coefficients

	B	SE	95% CrI
Between-person associations			
Loneliness – Self-esteem	–0.14	0.01	[–0.17, –0.11]
Loneliness – Emotion regulation difficulties	0.16	0.02	[0.12, 0.19]
Emotion regulation difficulties – Self-esteem	–0.17	0.02	[–0.21, –0.14]
Within-person associations			
Emotion regulation difficulties (T1) – Self-esteem (T1)	–0.08	0.01	[–0.10, –0.06]
Emotion regulation difficulties (T1) – Loneliness (T1)	0.08	0.01	[0.06, 0.11]
Self-esteem (T1) – loneliness (T1)	–0.06	0.01	[–0.08, –0.04]
Emotion regulation difficulties (T2) – Self-esteem (T2)	–0.06	0.01	[–0.08, –0.04]
Emotion regulation difficulties (T2) – Loneliness (T2)	0.06	0.01	[0.03, 0.08]
Self-esteem (T2) – loneliness (T2)	–0.05	0.01	[–0.06, –0.03]
Emotion regulation difficulties (T3) – Self-esteem (T3)	–0.03	0.01	[–0.04, –0.02]
Emotion regulation difficulties (T3) – Loneliness (T3)	0.04	0.01	[0.02, 0.05]
Self-esteem (T3) – loneliness (T3)	–0.03	0.01	[–0.04, –0.02]
Within-person autoregressive paths			
Emotion regulation difficulties (T1) → Emotion regulation difficulties (T2)	0.28	0.06	[0.15, 0.39]
Emotion regulation difficulties (T2) → Emotion regulation difficulties (T3)	0.28	0.06	[0.15, 0.39]
Loneliness (T1) → Loneliness (T2)	0.15	0.06	[0.02, 0.26]
Loneliness (T2) → Loneliness (T3)	0.15	0.06	[0.02, 0.26]
Self-esteem (T1) → Self-esteem (T2)	0.18	0.07	[0.04, 0.30]
Self-esteem (T2) → Self-esteem (T3)	0.18	0.07	[0.04, 0.30]
Within-person cross-lagged paths			
Loneliness (T1) → Self-esteem (T2)	–0.09	0.04	[–0.17, –0.01]
Loneliness (T2) → Self-esteem (T3)	–0.09	0.04	[–0.17, –0.01]
Emotion regulation difficulties (T1) → Self-esteem (T2)	–0.12	0.04	[–0.18, –0.04]
Emotion regulation difficulties (T2) → Self-esteem (T3)	–0.12	0.04	[–0.18, –0.04]
Self-esteem (T1) → Loneliness (T2)	–0.15	0.07	[–0.29, –0.00]
Self-esteem (T2) → Loneliness (T3)	–0.15	0.07	[–0.29, –0.00]
Emotion regulation difficulties (T1) → Loneliness (T2)	0.12	0.05	[0.03, 0.21]
Emotion regulation difficulties (T2) → Loneliness (T3)	0.12	0.05	[0.03, 0.21]
Self-esteem (T1) → Emotion regulation difficulties (T2)	–0.10	0.08	[–0.26, 0.06]
Self-esteem (T2) → Emotion regulation difficulties (T3)	–0.10	0.08	[–0.26, 0.06]
Loneliness (T1) → Emotion regulation difficulties (T2)	0.05	0.06	[–0.06, 0.16]
Loneliness (T2) → Emotion regulation difficulties (T3)	0.05	0.06	[–0.06, 0.16]

Note. Significant paths are bolded. Autoregressive paths and cross-lagged paths were constrained to be equal across time. Gender was controlled. See [supplementary material](#) for standardized coefficients.

person self-esteem (T2-T3). Results indicated no significant moderation effects, $b = -0.02$, 95% CrI $[-0.13, 0.09]$. In the second moderation model, emotion regulation difficulties were averaged across timepoints to create a between-person time invariant moderator. Its interaction with loneliness did not predict self-esteem, $b = -0.04$, 95% CrI $[-0.11, 0.02]$.

The third moderation model considered the interaction effect between within-person self-esteem and within-person emotion regulation difficulties at T1 and T2 in predicting loneliness (T2-T3). No significant moderation effect was found, $b = -0.10$, 95% CrI $[-0.28, 0.07]$. In the fourth moderation model, the interaction between self-esteem and time-invariant emotion regulation difficulties was considered. No significant moderation effects were found, $b = -0.08$, 95% CrI $[-0.19, 0.03]$.

Discussion

Emerging adults often experience major social transitions (e.g., moving away from home) that can heighten their vulnerability to loneliness. At the same time, the increased self-focus and growing responsibilities characteristic of this stage may place greater strain on self-evaluations. Although previous frameworks suggest that loneliness and self-esteem are linked, empirical evidence supporting their bidirectionality remains unclear, particularly during emerging adulthood (Buecker et al., 2024). Further, little is known about whether this association is shaped by other factors. Thus, the directionality between loneliness and self-esteem was examined in this study while considering the moderating role of emotion regulation difficulties.

Current findings indicated a bidirectional association between within-person increases in loneliness and within-person decreases in self-esteem among emerging adults. Specifically, individuals who experienced greater-than-typical levels of loneliness had poorer self-esteem over time. Similarly, those who had poorer self-esteem compared to their typical levels felt even lonelier over time. These findings align with existing theories on loneliness (Cacioppo & Cacioppo, 2018; Spithoven et al., 2017), but contrast with research showing that self-esteem did not significantly predict loneliness over time among college freshmen (Ti et al., 2022). Future research that tracks these dynamics over several years would clarify how these reciprocal associations evolve during emerging adulthood. For example, to the extent that social networks become increasingly unstable throughout emerging adulthood, such as when college students begin internships or seek new professional experiences in their sophomore years, the bidirectional association between loneliness and self-esteem may become more pronounced. Additionally, as the developmental trajectories of loneliness (Buecker et al., 2021) and self-esteem (Reitz, 2022) may change based on normative and non-normative life events, future research could examine how different social transitions (e.g., losing contact with friends or establishing a new social circle at work) and identity-relevant

events (e.g., social comparison of personal successes) influence these dynamics. This examination would help identify specific types of events that may strengthen or weaken the association between loneliness and self-esteem.

The Role of Emotion Regulation Difficulties

Individuals experiencing emotion regulation difficulties greater than typical levels were more likely to report greater loneliness and poorer self-esteem at the next wave. These findings corroborate the emotion regulation framework of loneliness (Preece et al., 2021), and address literature gaps on factors that may put emerging adults at risk of developing loneliness (see Kirwan et al., 2024 for a review). Moreover, they align with previous literature indicating individuals with lower self-esteem are more likely to use emotion regulatory strategies that bring only short-term benefits (e.g., distracting oneself from source of negative affect) over those that bring more long-term benefits (e.g., reappraising the emotionally laden experience) (Shafir et al., 2017).

Inconsistent with our hypothesis, within-person emotion regulation difficulties did not moderate the within-person association between loneliness and self-esteem. Similarly, emotion regulation difficulties did not emerge as a significant moderator when considered as a between-person time invariant construct. These findings differ from previous research that has demonstrated the moderating effects of emotion regulation on loneliness (Kaplan et al., 2023) and social connectedness (Marroquín et al., 2019). A possible explanation for this discrepancy pertains to the outcome of the present study (i.e., self-esteem) and the focus on mental health challenges in previous literature (Kaplan et al., 2023; Marroquín et al., 2019). Further, the within-person analytical approach used in the present study might have contributed to differences in findings, as previous research relied on cross-sectional and between-person approaches. Another reason could be that emotion regulation was measured broadly as emotion regulation difficulties, whereas more specific facets were measured in other studies, such as emotion suppression (Kaplan et al., 2023; Marroquín et al., 2019). Accordingly, a more nuanced measurement approach could be undertaken in future research, such as focusing on specific strategies (e.g., cognitive reappraisal).

Examining other aspects of emotion regulation may be also relevant. For example, affective self-regulation efficacy, defined as the perceived ability to manage positive and negative emotions (Bandura et al., 2003), has been shown to buffer the negative impact of emotional challenges. For example, it has been found to weaken the detrimental role of emotional reactivity on suicidal ideation and non-suicidal self-injury among adolescents (Liu et al., 2020), suggesting that individuals with higher affective self-regulation efficacy may cope better with intense emotional experiences. Given its role in buffering emotional reactivity, affective self-regulation efficacy may also help individuals manage the negative feelings

that arise from loneliness, as evidenced by its association with loneliness in adolescents (Calandri et al., 2021), and with self-esteem in emerging adults (Caprara et al., 2013). This line of research suggests that affective self-regulation efficacy may moderate the association between loneliness on self-esteem. Future research is needed to address these speculations.

In a more exploratory analysis, emotion regulation was examined as a potential moderator in the association from self-esteem to loneliness. Contrary to our hypothesis and prior work suggesting that self-concept clarity (a construct closely related to self-esteem) may interact with emotion regulation to predict mental health outcomes (Hong et al., 2022), emotion regulation neither strengthened nor weakened the association. Thus, further research is warranted, such as a consideration of other moderators. For example, the sociometer theory conceptualizes self-esteem as a social monitoring system that reflects perceptions of social acceptance and rejection (Leary & Baumeister, 2000). In line with this, rejection sensitivity, defined as the tendency to feel anxious about possible social rejections and expectations about rejection (Downey & Feldman, 1996), may interact with self-esteem to predict loneliness. This speculation is corroborated by longitudinal research demonstrating that low self-esteem predicted greater rejection sensitivity and loneliness among adolescents, and that rejection sensitivity also predicted loneliness over time (Zhou et al., 2020). Moreover, self-esteem has been found to weaken the negative association between rejection sensitivity and psychological well-being in both adolescents and emerging adults (Zulfiqar et al., 2024). Therefore, rejection sensitivity may interact with self-esteem to predict loneliness, and requires further research.

Limitations and Future Directions

Several limitations should be noted. Although participants were of different ethnic groups, they were sampled from a university and the majority was female-identifying individuals. Extending the examination to emerging adult working full-time in the greater community would offer greater insights to the examined associations. These individuals may experience greater independence due to factors such as financial autonomy and greater responsibility, which might impact how loneliness relates to self-esteem. For example, greater independence might result in more isolated experiences but increased responsibility at work may heighten or weaken self-esteem (e.g., success at work may promote self-esteem but challenges or failures may weaken self-esteem), potentially affecting the association between loneliness and self-esteem. Similarly, socioeconomic status (SES) may be an important factor to consider, as individuals with lower SES are more likely to experience loneliness (Solmi et al., 2020). This may be due, in part, to longer or less flexible working hours that limit opportunities for social interaction and relationship-building. Additionally, recruiting a more gender-balanced sample would be

useful in understanding gender differences in the association between loneliness and self-esteem.

Given that factors underlying loneliness may differ at different ages (Hawkey et al., 2022; Luhmann & Hawkey, 2016), a study that spans across the period of emerging adulthood would be useful in understanding how age differences contribute to loneliness and its relation to the key developmental task of establishing an identity. For example, individuals who continue to have low self-esteem or a poor sense of identity near the end of emerging adulthood may experience heightened levels of loneliness, given that a central task at this period of life is to establish an identity.

Although the UCLA loneliness scale that was used in this study includes items that recognize the multidimensional nature of loneliness, previous research does not provide consistent evidence to support its multi-factorial structure (see Maes et al., 2022 for a review). Thus, future research could extend current findings by operationalizing loneliness as a multidimensional construct. Specifically, loneliness could be differentiated as emotional loneliness that captures the absence of close attachment or deep and meaningful relationships, as well as social loneliness that reflects the absence of accessible social networks (Weiss, 1973). Whereas emotional loneliness may increase from early adolescence to emerging adulthood (around mid-20s), social loneliness may decline gradually and plateau around mid-20s (von Soest et al., 2020). Emotional and social loneliness may also predict mental health outcomes in differential ways (Bonsaksen et al., 2021; Mobach et al., 2024).

Based on this line of research, the differences in developmental trajectories in social and emotional loneliness may coincide with the development of self and identity in different ways. For example, emotional loneliness may undermine self-worth by signaling a lack of meaningful and supportive connections, whereas social loneliness may affect self-esteem through feelings of social exclusion or marginalization. Given that relationship qualities, such as acceptance, closeness, and warmth, play a critical role in shaping how individuals evaluate themselves (Harris & Orth, 2020), and that meaningful and emotionally supportive relationships have developmental salience in emerging adulthood (Arnett et al., 2014), emotional loneliness may have a stronger association with self-esteem during this developmental stage. Future research is needed to address these speculations.

Conclusion

Emerging adulthood is a period of increased self-focus and social instability. The present study extends previous literature on loneliness by considering its relation to self-esteem during emerging adulthood using a within-person longitudinal approach, while exploring the moderating role of emotion regulation difficulties. A bidirectional association between loneliness and low self-esteem was found at the between-person and within-person levels, suggesting that emerging

adults who experience higher levels of loneliness compared to their counterparts and their typical levels are at risk of lower self-esteem over time, and vice versa. Individuals with greater emotion regulation difficulties compared to their counterparts and their typical levels are also at risks of higher loneliness and lower self-esteem. These findings highlight the importance of supporting emerging adults in developing strategies to cope with loneliness, bolster self-esteem, and manage changes in both. Further, targeting emotion regulation difficulties may help mitigate the risks of loneliness and low self-esteem.

Author Note

This study was approved by the University of Toronto Research Ethics Board.

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Ethical Considerations

All research reported on in the manuscript was conducted in compliance with APA ethical principles.

Consent to Participate

Active informed consent was obtained from all participants in the study at each time of assessment.

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Supplemental Material

Supplemental material for this article is available online.

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