

Vulnerable self-disclosure co-develops in adolescent friendships: Developmental foundations of emotional intimacy

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Abstract

This study examines the development of vulnerable self-disclosure in supportive interactions from ages 13 to 29. A diverse community sample ($N = 184$; 85 boys 99 girls; 58% white, 29% Black, 13% other identity groups) participated in annual observed interactions with close friends and romantic partners. Participants were observed as they sought and provided support to their best friends each year from age 13 to 18, and as they sought support from their romantic partners from age 19 to 29. Random intercept cross-lagged panel models were used to parse markers of within-individual change in vulnerable self-disclosure observed annually across ages 13 to 18. A follow-up regression model also investigated cascading associations from vulnerable self-disclosure in adolescent friendships to vulnerable self-disclosure in adult romantic relationships. When adolescents sought support, they demonstrated greater-than-expected increases in self-disclosure each year when their best friends demonstrated relatively high self-disclosure. For girls in this sample, when providing support, they demonstrated greater-than-expected decreases in self-disclosure each year when their best friends demonstrated relatively high self-disclosure. Adolescents whose friends disclosed highly to them also tended to express more vulnerability with romantic partners in adulthood. Post-hoc analyses investigate the role of friendship stability and gender as potential

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moderators of self-disclosure development. The best friendship, a key source of emotional support, serves as a foundational context for learning appropriate use of vulnerable self-disclosure when seeking and providing emotional support, which persists across time and relationships.

Keywords

Adolescents, development, emotional support, friendships, intimacy, longitudinal, peer relationships, self-disclosure

Introduction

The adolescent friendship provides a key context for individuals to practice and consolidate support-related social skills (Allen et al., 2022). One such skill, *vulnerable self-disclosure*—the sharing of personal, private information about oneself in order to be known to another person—may serve as a mechanism by which intimacy develops among close friends, particularly in support-seeking conversations (Pearce & Sharp, 1973). Attachment theorists emphasize that the ability to seek and provide supportive care is necessary for establishing and maintaining intimacy in close relationships (Cassidy, 2001). Social contexts, such as intimate friendships, play a substantial role in shaping individuals' understanding of themselves, others, and social behaviors, forming an "internal working model" of relationships that, in turn, shapes the management of future social contexts (Mikulincer & Shaver, 2020). Interactions with friends in adolescence may be key for establishing and shaping adolescents' developmental trajectories for key attachment processes, such as self-disclosure in support-seeking and support-providing interactions. This study tests the premise that vulnerable self-disclosure in adolescents' friendships develops dynamically over time, such that interactions with a highly disclosing friend at one time point will predict the adolescent becoming more sensitive and appropriate in disclosing in close relationships going forward, and that self-disclosure in adolescent friendship sets the stage for self-disclosure processes in adult romantic relationships.

Vulnerable self-disclosure is fundamental for instigating social support—a key marker of building intimacy, deepening social bonds, and developing mature adult social functioning (Bauminger et al., 2008). During adolescence, friendships become a central source of support and intimacy, and provide information about social norms such as when self-disclosure is appropriate in relationships (Bowker & Weingarten, 2022). Adolescents calibrate their social behaviors based on the behaviors of others, with a tendency to behave more similarly to their peers over time (Allen & Antonishak, 2008). According to Social Learning Theory, adolescent friendships could shape teens' behavior through observation of friends' behavior and through friends' reactions to a teen's own behavior (Bandura & Watson, 1977). When the social behavior in question, such as self-disclosure, makes one more vulnerable, adolescents may be particularly attuned to their peers' reactions and responses

(Somerville, 2013). Teens may learn when and how to self-disclose in large part by observing *close peers'* self-disclosure. When a moment of vulnerability is met with vulnerability in turn, the implicit message holds that it is safe and acceptable to self-disclose within that friendship. Therefore, adolescents likely *co-develop* their self-disclosure within best friendships, such that each teen's self-disclosure is inherently linked to both their own comfort with vulnerability as well as the way that the other responds to that self-disclosure over time. Therefore, we hypothesize that *in support-seeking interactions, adolescents will demonstrate greater increases in their own self-disclosure when their best friends demonstrate high self-disclosure* (Hypothesis 1).

Of course, it is not always helpful to simply disclose *more* across all situations, and adolescents must learn to deploy vulnerability and self-disclosure with a degree of discernment based on the conversational context. For instance, an adolescent who responds to friends' *already* vulnerable calls for support by sharing things about themselves excessively or exclusively, turning the focus of the conversation toward themselves, is not likely to be perceived as supportive or helpful by peers. With practice, adolescents have more opportunities to use that self-disclosure flexibly and skillfully, based on conversational roles and contexts. Importantly, both support-seeking and support-providing are fundamental aspects of intimacy (Cassidy, 2001). One key component of intimate relationships is reciprocity: members of a close dyad will serve as both support-seeker and support-provider, over time (Zaki & Williams, 2013). Within their close friendships, adolescents engage in supportive turn-taking, which builds foundational social skills that facilitate intimacy—listening and supporting chief among those skills (Bauminger et al., 2008). Within this framework of developing intimacy and the capacity to serve as a relational partner, support and self-disclosure processes are driven by a sort of give-and-take of attention: requesting attention when seeking support and relinquishing that same attention when providing support. As teens develop self-awareness, empathy, and self-regulation, moving beyond a self-centered frame of reference, they ideally learn to refrain from self-disclosing when serving in a listening, supporting role, a marker of developmental maturity (Rubin et al., 1993). Just as *receiving* attuned, supportive responses from an interaction partner is rewarding, so is *providing* attuned, supportive responses to an interaction partner (Allen et al., 2023; Andalibi et al., 2017; Reissman, 1965). Adolescents who have experience responding supportively to friends' self-disclosure may provide less of their own self-disclosure in future supportive interactions, perhaps because of improved capacity to shift conversational focus from the self to close others in an effort to demonstrate listening and provide support (Schwartz-Mette & Rose, 2009, 2016). Therefore, we hypothesize that *in support-providing interactions, adolescents will demonstrate greater decreases in their own self-disclosure when their best friends demonstrate high levels of self-disclosure* (Hypothesis 2).

As adolescents practice and adjust their levels of self-disclosure within their best friendships, they begin to establish relational frameworks for understanding themselves and others. Through repeated experiences with their peers, adolescents learn how much others tend to share, how others might react to their sharing, and how much is appropriate to share with others in response (Franzoi & Davis, 1985; Marroquin et al., 2019). The extent to which adolescents learn to use self-disclosure has been suggested as a key

foundation for teens' contemporaneous and future management of emotions and relationships (Bauminger et al., 2008). Repeated, positive experiences initiating and responding to vulnerable self-disclosure likely reinforces an individual's belief that they are capable of being vulnerable, that others receive and respond to their vulnerability, and that they can effectively titrate their own vulnerability to support more-vulnerable friends (Mikulincer & Shaver, 2016). Over time and across relationships, adolescents knit together their understanding of many experiences with vulnerable exchange and support, establishing a working model of relationships that guides expectations of future relationships and future interpersonal behaviors.

Ultimately, interpersonal capacities developed in peer relationships are likely to have significant bearing on adolescents' well-being and interpersonal relationships long term (Sloan, 2010). With regard to vulnerable self-disclosure, by sharing personal information, adolescents communicate an implicit desire to be known by their relationship partner (Ashktorab et al., 2017; Liu & Brown, 2014). Closeness and trust facilitate emotional support, improve relationship quality, and ultimately cascade into future relationships when disclosers view their friend's or partner's responses as validating, caring, and supportive (Cordova & Scott, 2001; Laurenceau et al., 2005; Reis & Shaver, 1988). Furthermore, experiences within adolescent friendships form the foundation for relational functioning in adulthood, as they set the stage for similar processes in future romantic relationships (Allen et al., 2020; Loeb et al., 2020; Waters & Sroufe, 1983). Previous work has characterized the importance of the adolescent best friendship, the "chumship," as pivotal for learning the nuances of establishing, negotiating, and maintaining the role of oneself and close others in attachment relationships (Sullivan, 1953/2013; Furman, 2018). Previous work has discussed the importance of translating skills developed in same-gender friendships to cross-gender romantic relationships, and ultimately proposed that the underlying principles that promote intimacy remain the same (Connolly et al., 2018; Reis, 2017). Adolescents whose internal working models of relationships maintain that self-disclosure is safe, initiates support, and helps one feel known to others are more likely to go forward and self-disclose to any close relationship partner (Papini et al., 1990). Thus, adolescents whose friendships are marked by more vulnerable self-disclosure will be more likely to demonstrate more vulnerable self-disclosure in adulthood with their romantic partner. Therefore, we hypothesize that *participants whose friends demonstrate more vulnerable disclosure when support-seeking in adolescence will demonstrate more vulnerable disclosure to romantic partners when support-seeking in adulthood* (Hypothesis 3).

The current study is a long-term investigation of the development of self-disclosure as it evolves within close relationships over time. The study used prospective multi-reporter data in a socio-demographically diverse community sample, followed from age 13 to 29 to test the following hypotheses regarding understanding vulnerable self-disclosure (first in a support-seeking and then in a support-providing task) between adolescents and their best friends and romantic partners across development. Throughout this study, we primarily consider the perspective of the focal participants, because they are consistent actors throughout the study.

Hypotheses

1. When best friends demonstrate high self-disclosure during adolescents' support seeking, adolescents will demonstrate greater increases in their own self-disclosure in later support-seeking interactions
2. When best friends demonstrate high self-disclosure during adolescents' support providing, adolescents will demonstrate greater decreases in their own self-disclosure in later support-providing interactions.
3. Participants whose friends demonstrate more vulnerable disclosure when support-seeking during adolescence (aggregated age 13–18) will demonstrate more vulnerable disclosure to romantic partners when support-seeking in adulthood (aggregated age 19–29).

Method

Participants

This study was part of a longitudinal investigation of social development across adolescence and young adulthood. Participants included 184 adolescents (85 boys and 99 girls) residing in Charlottesville, Virginia. Participants were assessed annually; this study utilizes assessments with friends at age 13 ($M_{\text{age}} = 13.35$, $SD = .64$) through age 18 ($M_{\text{age}} = 18.38$, $SD = 1.04$), as well as assessments with romantic partners at age 19 ($M_{\text{age}} = 19.66$, $SD = 1.07$) through age 29 ($M_{\text{age}} = 28.59$, $SD = 1.02$) (see [Supplemental Table 1](#) for detailed age breakdown by assessment). Participants were originally recruited from the seventh and eighth grades of a public middle school drawing from suburban and urban populations in the Southeastern United States. Students were recruited via an initial mailing to all parents of students in the school along with follow-up contact efforts at school lunches. Families of adolescents who indicated interest in the study were contacted by telephone. Of all students eligible for participation, 63% agreed to participate either as target participants or as friends who participated in interactions tasks with the target teen. Once a student participated as a friend, they were no longer eligible to be a primary participant.

The sample was racially and socioeconomically diverse: 107 adolescents (58%) identified themselves as White, 53 (29%) as Black, 15 (8%) as Multiracial, and 9 (5%) as being from other identity groups, which approximately mirrors the distribution of the catchment area for the school from which the sample was drawn. Adolescents' parents reported an annual median family income in the \$40,000–\$59,999 range, relative to a national median household income of approximately \$39,000 at the time (U.S. Census Bureau, 1999).

Each year, target adolescents nominated their closest friend to be included in survey and observational measures with them in the study. The same peer participated in subsequent years, on average, 42.3% of the time (min = 35.9%, max 45.5%; see [Supplemental Table 2](#)). All best friend dyads identified as same-gender, although this was not a requirement to participate in the study.

In adulthood, participants' romantic status was assessed annually. Participants' romantic partners were invited to participate in sets of three-year windows (when participants were roughly age 18–20, 21–23, 24–26, and 27–29). Within each window, participants and their romantic partners were invited to participate in observational measures once after reporting a relationship of at least 3 months in duration ($M_{\text{duration}} = 1.18$ years at age 19 to 4.04 years at age 29; see [Supplemental Table 3](#)). Of the 184 participants in the overall sample, 85, 92, 96, and 110 participated with a romantic partner at the four data collection time points, respectively. Participants had mean ages of 19.66 ($SD = 1.07$), 22.80 ($SD = .96$), 25.69 ($SD = .99$), and 28.59 ($SD = 1.02$) years old. Partners had mean ages of 20.34 ($SD = 3.39$), 23.25 ($SD = 3.40$), 26.71 ($SD = 3.24$), and 27.98 ($SD = 3.84$). The same partner participated on subsequent waves 23–50% of the time (see [Supplemental Table 2](#)). Relationship status and participation with a romantic partner at both time points was not associated with demographic variables or self-disclosure. All participating couples identified as heterosexual, although this was not a requirement to participate in the study.

Procedures

In the initial introduction and throughout each session, confidentiality was explained to all participants, and adolescents were told that their parents would not be informed of any of the answers they provided. A Confidentiality Certificate issued by the U.S. Department of Health and Human Services protected all data from subpoena by federal, state, and local courts.

Attrition analysis

On average, individuals participated at 6.34 of the 7 study time points (when “adulthood” is considered one aggregated study time point; $SD = 1.16$). Attrition at each study time point was also low, with participation rates of 89% at age 14, 88% at age 15, 88% at age 16, 90% at age 17, and 74% at age 18. Of the 184 teens who participated at age 13, 94% also participated at some point in adulthood. Individuals who completely dropped out of the study (participated at age 13 but did not participate in adulthood) did not differ from teens who remained in the study on any baseline measures (friendship quality or self-disclosure), gender, or familial income. Nevertheless, to best address any possible biases due to attrition in longitudinal analyses or missing data within waves, we used full-information maximum-likelihood methods with the full original sample for all analyses. These methods have been found to yield the least-biased estimates when all available data are used for longitudinal analyses (vs. listwise deletion of missing data; [Arbuckle, 1996](#)).

Measures

Self-disclosure when support-seeking and support-providing (age 13–18 annually with best friends; age 18–30 every three years with romantic partners). Target teens and their nominated close friends participated in a series of video-recorded social interaction tasks in

private rooms within a university building annually from age 13 to 18. Target teens participated in the support-seeking task again with their romantic partners up to four times in adulthood. In the first six-minute task, participants asked their interaction partners for support on a self-selected topic. In the second six-minute task, interaction partners asked participants for support on a self-selected topic. These interactions were then coded for the levels of Self-Disclosure made by the participant and their interaction partner, using the Supportive Behavior Task Coding System for Adolescent Peer Dyads (Allen et al., 2001).

Participants and interaction partners were told the following: “We want to find out about how people talk about problems that they are having. What I’m going to be asking you to do is to tell me about something in your life that you think is kind of a problem. It doesn’t have to be the biggest problem in your life, just something you’d like to talk to [friend] about.” To promote participant comfort engaging with the task, research assistants facilitated separate brainstorming discussions with each interaction partner regarding conversation topics prior to the tasks, and then left the participant and their interaction partner alone while the discussion occurred. Video equipment was kept out-of-sight through a relatively unobtrusive one-way mirror, to reduce potential discomfort of being filmed. Participants were offered the opportunity to opt out of the task at any time and after the task was completed; no participants opted to have their videos destroyed. This task has been previously used to investigate aspects of social support development in adolescence (e.g., Stern et al., 2021).

The Self-Disclosure code describes the most intense level to which the teen shares information about themselves throughout the task, particularly private information that would make the other person in the interaction feel as though they know the speaker better. Coders identify the most vulnerable statement made by each interaction partner during the task and assign it a score from 0 to 4. Scores are generated based on a combination of the intensity of affect, level of vulnerability displayed, how controversial the statement might be; and are overall intended to capture how embarrassed or uncomfortable the *typical* person might feel disclosing the information that is stated, regardless of how the teen appears to feel about it in the moment. The most vulnerable self-disclosure statement is scored as 0 = *brief or non-controversial likes and dislikes or wants and needs are expressed* (e.g., “I like playing videogames before dinner”); *teens are talking about their day in a way that doesn’t capture much personal or vulnerable information*, 1 = *personal opinions or facts about self, with some potential to be embarrassing* (“My grade will be fine, but I think I might fail this Spanish quiz”); 2 = *expressing thoughts, opinions, or facts about self that are not always readily expressed and have more potential to feel embarrassing* (“I don’t know my way around the school—how are we supposed to know where the classrooms are?”); 3 = *feelings that are less socially acceptable or facts that are a little more unusual, emotional, and/or seem important to the speaker* (“I’m worried we’re going to have a hard time staying in touch this summer”); and 4 = *conversation contains content not commonly shared between somewhat close friends; teens expressed strong feelings that are less socially acceptable, such as sadness, fear, loneliness, or anxiety* (“Ever since my parents’ divorce, they keep fighting in front of me and they drag me into it”). In this coding system, the statement that contains the *highest* level of self-disclosure within the interaction is scored in order to capture the most vulnerable communication involved in the interaction.

All video-recorded interactions were double-coded by graduate student coders who trained for one semester on the manual and a set of practice videos until they attained reliability (within 1-point score on all codes) with the existing coding group. All coders provided ratings for a subset of one seventh of the videos to confirm reliability; if coders were not reliable, disagreements were discussed, and group consensus was reached. Using these codes, we also generated two aggregated adolescent self-disclosure variables (one for each member of the dyad) by taking the mean of all Task 1 self-disclosure scores from age 13 to 18. We then did the same for all Task 1 self-disclosure scores for participants and romantic partners in adulthood. Intraclass Correlations ranged from .69–.75, falling in the good- to excellent range for this statistic (Cicchetti & Sparrow, 1981).

Relationship status (age 20–29). Participants reported on whether they were in a romantic relationship of at least 3 months in duration, annually, from age 20 to 29. Responses were coded as *yes* = 1 and *no* = 0. The first time participants indicated that they were in such a relationship, they were invited to participate in observational tasks and questionnaire measures with their romantic partner.

Participant demographic information (age 13). Participant gender was collected at the start of the study, participants were asked to choose between “male” and “female” as their gender identity. Participants’ parents reported on annual household income on a scale where 1 = *under \$5,000*; 2 = *\$5,000–9,999*; 3 = *\$10,000–14,999*; 4 = *\$15,000–19,999*; 5 = *\$20,000–29,999*; 6 = *\$30,000–39,999*; 7 = *\$40,000–59,999*; and 8 = *\$60,000 or more*.

Analytic plan

To investigate Hypotheses 1 and 2, *R* package *lavaan* (Rosseel, 2012) was used to construct random intercept cross-lagged panel models (RI-CLPM) using Full Information Maximum Likelihood to handle missing data (Arbuckle, 1996). These models were selected for their use of latent variable means to calculate a random intercept which parses between-subjects variance, allowing for within-subject interpretation of longitudinal model parameters (Mund & Nestler, 2019). By using RI-CLPM, we can examine within-individual deviations from expected levels of a construct across time points (i.e., amount of self-disclosure one year later), based on the individual’s overall pattern of interaction. RI-CLPM was selected because of our interest in investigating predictors of *within-individual variation* from expected trajectory and given our limited sample size to run more sophisticated analyses (Shi et al., 2023). Ultimately, these analyses aim to build our understanding of peer self-disclosure behaviors as they may associate with increasing or decreasing self-disclosure development, after accounting for an individual’s existing pattern (i.e., their trait-like tendency to self-disclose).

The variance of each observed score for participants’ and their best friends’ self-disclosure each year were decomposed into between-person and within-person components via the inclusion of random intercepts. We compared models with the cross-lagged paths constrained to be equal to models where each cross-path in turn was allowed to vary across time points (we did not have significant power to allow all paths to vary at once). We found

that the unconstrained models did not significantly improve model fit, and thus proceeded with the models in which structurally similar paths were constrained to be equal. Covariances between same-year variables were included in the model (covariances were unconstrained at time point one and constrained to be equal at all other time points). The main effects-of-interest in the current study were the cross-lagged effects from best friends' self-disclosure behaviors to participants' self-disclosure behaviors. The first model characterized associations between best friends' self-disclosure and participants' self-disclosure when the participant sought support from the best friend. The second model characterized associations between best friends' self-disclosure and participants' self-disclosure when the best friend sought support from the participant.

With regard to Hypothesis 3, we tested potential long-term links of self-disclosure experienced across adolescence to self-disclosure experienced across adulthood. Therefore, here, we focus only on self-disclosure within participants' support-seeking interactions from friends in adolescents and romantic partners in adulthood. We constructed a regression model that controls for gender identity and predicts self-disclosure in adulthood from peers' self-disclosure in adolescence, after covarying self-disclosure in adolescence (in order to assess relative change in participants' self-disclosure).

Results

Preliminary analyses

Raw means, standard deviations, and sample sizes for all variables are presented in Table 1. Means and intercorrelations of aggregated self-disclosure levels to best friends and romantic partners are presented in Table 2 (see Supplemental Tables 4 and 5 for correlations of self-disclosure by year).

Primary analyses

Hypothesis 1. When best friends demonstrate high self-disclosure during adolescents' support seeking, adolescents will demonstrate greater increases in their own self-disclosure in later support-seeking interactions.

First, a model was analyzed describing the autoregressive and cross-lagged predictions between teens and their supportive peers in teens' advice-seeking ($AIC = 5034.75$, $BIC = 5102.15$, $CFI = .84$, $TLI = .85$, $RMSEA = .05$, $SRMR = .10$; See Figure 1 and Table 3). The model identified significant autoregressive predictions from participants' own disclosure each year ($\beta = .16$, $p < .001$), suggesting that teens who disclose relatively more one year were likely to continue to disclose relatively more in the subsequent year. Furthermore, significant lagged predictions were identified from best friends' disclosure one year to participants' disclosure the following year ($\beta = .15$, $p < .01$). Thus, over and above teens' own disclosure levels, when a best friend disclosed relatively highly one year, participants were likely to demonstrate relative increases in self-disclosure the following year.

Table 1. Self-disclosure in two observed interactions across adolescence.

	N	When participant seeks support				When best friend seeks support			
		Participant self-disclosure		Best friend self-disclosure		Participant self-disclosure		Best friend self-disclosure	
		M (SD)	Range	M (SD)	Range	M (SD)	Range	M (SD)	Range
Age 13	179	1.46 (.97)	0–4.00	.89 (.81)	0–4.00	1.78 (.67)	0–4.00	.92 (.98)	0–3.75
Age 14	164	1.37 (.89)	0–4.00	.76 (.68)	0–3.00	.54 (.80)	0–3.25	1.03 (.99)	0–3.75
Age 15	149	1.23 (.89)	0–3.75	.72 (.74)	0–3.50	.19 (.45)	0–2.00	.62 (.74)	0–3.50
Age 16	147	1.16 (.95)	0–4.00	.48 (.66)	0–3.75	.29 (.48)	0–2.75	.78 (.82)	0–3.00
Age 17	141	.79 (.87)	0–3.67	.43 (.59)	0–2.50	.14 (.44)	0–3.00	.55 (.77)	0–3.00
Age 18	129	.67 (.77)	0–3.00	.25 (.49)	0–2.75	.22 (.44)	0–3.00	.72 (.80)	0–3.25

Note. N reflects N participants with data for all variables at each age of data collection.

Table 2. Descriptive statistics and bivariate correlations of mean disclosure levels when participant seeks support.

	M	SD	2. Best friend disclosure	3. Participant to romantic partner disclosure
1. Participant to best friend disclosure (age 13–18)	1.19	.58	.42***	.21*
2. Best friend disclosure (age 13–18)	.63	.41	--	.24**
3. Participant to romantic partner disclosure (age 19–29)	.55	.47		--

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

A follow-up, multi-group model was analyzed to investigate differences in developmental trajectories by gender. The multi-group model was found to be significantly different from the single-group model ($\Delta\chi^2(2) = 9.46, p = .01$; AIC = 4978.05, BIC = 5106.43, CFI = .80, TLI = .82, RMSEA = .06, SRMR = .14; See Supplemental Table 6). When the sample is split by gender, associations from best friends’ disclosure one year to participants’ disclosure the following year were slightly stronger for girls ($\beta = .14, p = .03$) than for boys ($\beta = .12, p = .05$).

Hypothesis 2. When best friends demonstrate high self-disclosure during adolescents’ support providing, adolescents will demonstrate greater decreases in their own self-disclosure in later support-providing interactions.

A second model was identified to describe the autoregressive and cross-lagged predictions between participants and best friends when the best friend seeks support and the participant provides support (AIC = 4743.02, BIC = 4810.42, CFI = .87, TLI = .88, RMSEA = .04, SRMR = .09; See Figure 2 and Table 4). This model identified

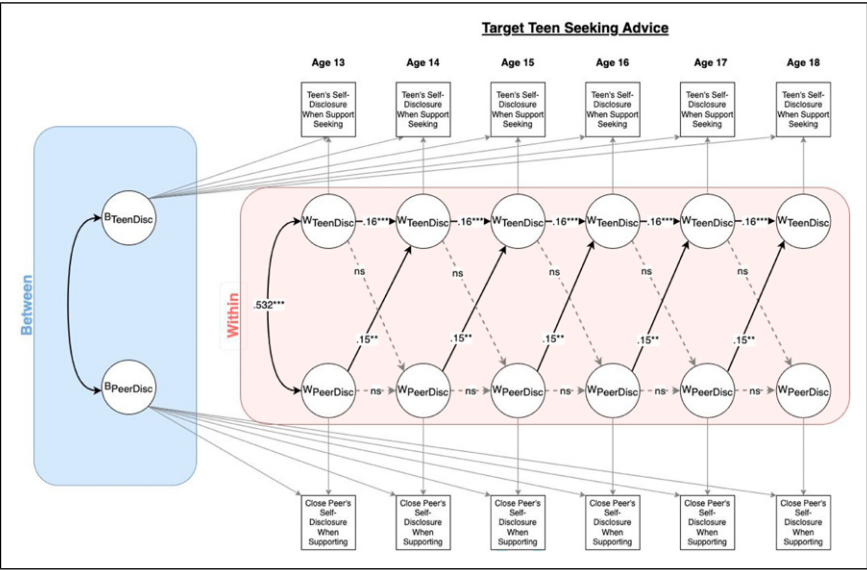


Figure 1. Random Intercept Cross-Lagged Panel Model displaying autoregressive and cross-lagged relations between teens’ self-disclosure when seeking support and their peer’s self-disclosure when providing support from age 13 to 18. Covariances between variables at each age not displayed for clarity.

Table 3. Summary of RI-CLPM parameters: Participant seeking support interaction (task 1).

	β	SE	p
Lagged parameters			
Best friend disclosure → participant disclosure	.15	.05	.004
Participant disclosure → best friend disclosure	.08	.05	.10
“Momentum” parameters			
Participant disclosure → participant disclosure	.16	.04	<.001
Best friend disclosure → best friend disclosure	.04	.04	.38
Covariance parameters			
Participant disclosure <> best friend disclosure (T1)	.53	.09	<.001
Participant disclosure <> best friend disclosure (T2-T6)	.30	.04	<.001

autoregressive predictions within best friends’ disclosure when support-seeking ($\beta = .25$, $p < .001$) and participants’ self-disclosure when providing support ($\beta = .10$, $p < .05$), both of which suggest that relatively high self-disclosure for one member of the dyad at one time point predicts relatively high disclosure for that person at the following time point. Additional lagged predictions were identified from best friends’ self-disclosure when seeking support to participants’ self-disclosure when providing support, such that

participants demonstrated *lower* self-disclosure than expected when their best friends self-disclosed highly the prior year ($\beta = -.13, p < .05$).

A follow-up multi-group model was analyzed to investigate differences in developmental trajectories by gender. The multi-group model was found to be significantly different from the single-group model ($\Delta\chi^2(2) = 5.03, p = .02$); AIC = 4612.91, BIC = 4741.29, CFI = .72, TLI = .74, RMSEA = .05, SRMR = .14; See [Supplemental Table 7](#)). Specifically, associations from best friends' disclosure one year to participants' disclosure the following year remained for girls ($\beta = -.21, p = .001$) but were no longer significant for boys ($\beta = .06, p = .40$).

Hypothesis 3. Participants whose friends demonstrate more vulnerable disclosure in emotional support interactions during adolescence (age 13–18) will demonstrate more vulnerable disclosure to romantic partners when support-seeking in adulthood (age 19–29).

In pursuit of this hypothesis (and to capture a composite of self-disclosure experiences across time), we focused on the participant-seeking support conversations from age 13 to 29. We generated mean scores for depth of self-disclosure in adolescence and adulthood for each individual. Then, a regression was run in which participants' disclosure to their romantic partners across adulthood was predicted by participants' gender, participants' disclosure to their best friends in adolescence, and their best friends' disclosure to them in

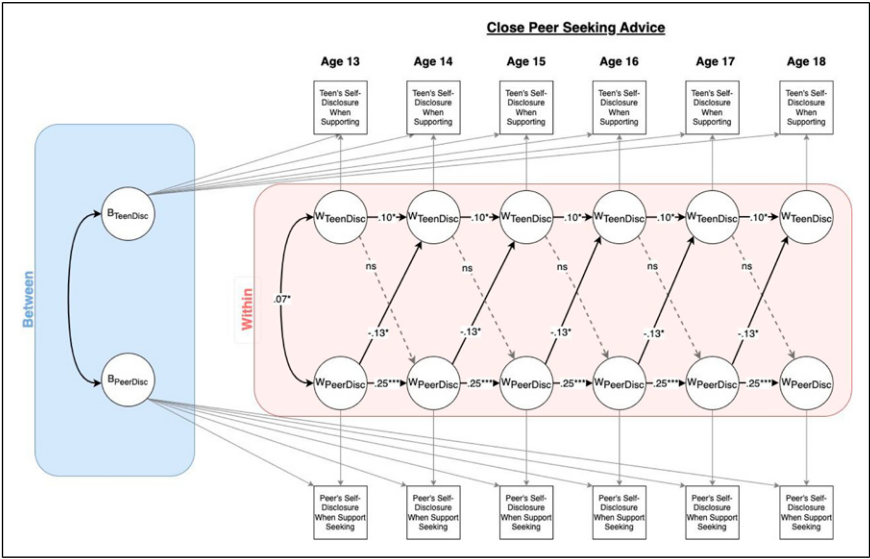


Figure 2. Random Intercept Cross-Lagged Panel Model displaying autoregressive and cross-lagged relations between teens' self-disclosure when providing support and their peer's self-disclosure when seeking support from age 13 to 18. Covariances between variables at each age not displayed for clarity.

adolescence (see Table 5). Results suggest that participants whose best friends were highly disclosing in adolescence demonstrated relatively high levels of self-disclosure in their adult romantic relationships ($\beta = .17, p < .05$), even after accounting for those participants' baseline levels of self-disclosure.

Post hoc analyses

Short-term changes in self-disclosure in subsequent interactions. We considered the possibility that the serial nature of the tasks may influence the degree of self-disclosure demonstrated by the participant and the friend across adolescence: Every year, the participant's support-seeking interaction (Task 1) preceded the best friend's support-seeking interaction (Task 2); opening the opportunity to investigate the best friend's adjustments in self-disclosure when *they* seek advice, based on the level of self-disclosure displayed by the participant *immediately prior*.

Regression analyses were run to predict relative changes in best friend's self-disclosure from the first task to the second task each year, after controlling for gender and income. From Age 14 to 17, participants' levels of self-disclosure in Task 1 predicted increases in best friends' level of self-disclosure in Task 2, over and above best friends' levels of self-disclosure in Task 1, after controlling for adolescents' self-reported gender identity and parent-reported family income (see Supplemental Table 8). Most years, participants' self-disclosure predicted relative increases in friends' self-disclosure; the only exception was

Table 4. Summary of RI-CLPM parameters: Best friend seeking support interaction (task 2).

	β	SE	p
Lagged parameters			
Best friend disclosure $\rightarrow$ participant disclosure	-.07	.06	.21
Participant disclosure $\rightarrow$ best friend disclosure	-.13	.05	.02
"Momentum" parameters			
Participant disclosure $\rightarrow$ participant disclosure	.10	.04	.02
Best friend disclosure $\rightarrow$ best friend disclosure	.25	.04	<.001
Covariance parameters			
Participant disclosure $\leftrightarrow$ best friend disclosure (T1)	.07	.03	.04
Participant disclosure $\leftrightarrow$ best friend disclosure (T2-T6)	.24	.04	<.001

Table 5. Predicting participant disclosure to romantic partner in adulthood (age 19–29).

	β	ΔR^2	Total R^2
Gender	.02	.01	.01
Participant self-disclosure to best friend in adolescence (age 13–18)	.09	.03	.04
Best friend self-disclosure to participant in adolescence (age 13–18)	.17*	.04*	.08*

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

at age 16, when participants' self-disclosure predicted a decrease in friends' self-disclosure. Collapsing across participation years, we see similar, stronger predictions such that the change in disclosure offered by the best friend in their support-seeking task is predicted by the amount of disclosure demonstrated by the participant in their support-seeking task.

Friendship and romantic relationship stability versus change. We considered the possibility that continuity (or lack of continuity) of the closest friend over time would be associated with self-disclosure across adolescence. Codes were created at each wave indicating whether the same friend did (Friendship Stability = 1) versus did not (Friendship Stability = 0) participate the previous year. Preliminarily, self-disclosure by the participant and best friend in both the participant-seeking support and friend-seeking support conditions were not correlated with whether the friend participating was the same or different friend as the prior time point (all p 's > .09).

A series of linear regression models were run to evaluate year-by-year predictions in changes in adolescents' vulnerable self-disclosure based on friendship stability and the interaction between friendship stability and prior vulnerable self-disclosure (to best approximate moderation of identified cross-lagged effects). This approach was chosen both to best approximate moderation of identified cross-lagged relations in Models 1 and 2, and because of limitations in the flexibility of the RI-CLPM using this sample size to evaluate time-varying, manifest moderators on latent predictions (Mulder, 2021). No significant predictions were identified from the interaction between friendship stability and level of vulnerable self-disclosure demonstrated the prior year, by both participants and their best friends, in both participant support-seeking and friend support-seeking conditions (see Supplemental Tables 9 and 10). The same approach was used to evaluate stability versus change in romantic partners in subsequent data collections; no significant associations were found (see Supplemental Table 11).

Self-disclosure and gender moderation. We also considered the possibility that participants' gender would be associated with differences in the development of self-disclosure year-by-year across adolescence. A series of linear regression models were run to evaluate year-by-year predictions in changes in adolescents' vulnerable self-disclosure based on gender and the interaction between gender and prior vulnerable self-disclosure (to assess differential development for boys and girls in the sample). No significant predictions or interactions between gender and self-disclosure were identified in adolescence or adulthood (see Supplemental Table 12).

Discussion

Self-disclosure in adolescence has been identified as critical to meeting social developmental goals and forging close, connected friendships and relationships (Vijayakumar & Pfeifer, 2020). In the current study, we examined the development of patterns of vulnerable self-disclosure over time between adolescents and their best friends. Results were consistent with the hypothesis that experiencing vulnerable self-disclosure in a

friendship leaves adolescents more attuned to appropriate use of disclosure going forward: In support-*seeking* interactions, adolescents whose best friends demonstrated high vulnerable self-disclosure one year showed greater-than-expected increases in vulnerable self-disclosure the following year. In support-*providing* interactions, girls whose best friends demonstrated high vulnerable self-disclosure one year showed greater-than-expected *decreases* in self-disclosure the following year (this pattern was not significant for boys in this sample). Finally, best friends' disclosure in adolescence predicted adolescents' self-disclosure to romantic partners in adulthood.

Self-disclosure in support-seeking interactions

Taken together, these results are complex, yet consistent with the hypothesis that best friends' behaviors predict adolescents' tendency to self-disclose over time. Participants demonstrated greater-than-expected increases in self-disclosure during their own support-seeking conversations when best friends demonstrated high self-disclosure *when supporting them* the prior year. Adolescents in this study calibrated their levels of vulnerable self-disclosure based on implicit interpersonal information regarding their best friend's willingness to self-disclose; these greater-than-expected increases in vulnerability when presented with friends' vulnerability suggests that there is a rewarding, intimacy-building process underlying self-disclosure. The more that adolescents' friendships become contexts in which vulnerable self-disclosure regularly occurs, the more this behavior *continues* to occur, facilitating increasing opportunities for adolescents to practice managing vulnerability within support-seeking and support-providing interactions (Costello et al., 2023). This then becomes the essence of the development of intimacy within adolescent close friendships. In that development, the repeated opportunity for practice may be key: vulnerable self-disclosure is inherently socially risky, and adolescents are particularly sensitive to loss of social status, negative judgment, and rejection (Somerville, 2013). Given iterative opportunities to "try out" vulnerable self-disclosure with friends who also engage in vulnerability, adolescents may develop self-disclosure as a skill that is crucial for meeting social and emotional needs (Franzoi & Davis, 1985).

Self-disclosure in support-providing interactions

As adolescents develop skills in vulnerable self-disclosure, they also learn to adjust their self-disclosure depending on their conversational role. When adolescent girls were *supporting* their best friend, and the best friend self-disclosed relatively highly one year, participants demonstrated *decreases* in their self-disclosure the following year when supporting their friend. That is, adolescents reduced the amount of self-disclosure they offered when providing support to a best friend in need, suggesting they do not simply respond to "more" disclosure with "more" disclosure in turn, but rather, that they are engaged in more nuanced social learning processes. Herein lies a degree of complexity: although adolescents demonstrated increases in self-disclosure when their own support-seeking was met with friends' disclosure, some adolescents (girls) tended to "cede the floor" and disclose less in the year following in response to high self-disclosure from friends who sought support

from them. Generally, youth undergo two processes in parallel: they must learn to be vulnerable and they must learn to respond to others' vulnerability, both of which are key to developing social connection and intimacy (Cassidy, 2001). Here, we have offered one potential interpretation of these findings: we have conceptualized the participants' support-seeking interactions as a learning experience about the safety of their *own* vulnerability (i.e., friends' vulnerability is reinforcing in that it signals vulnerability as acceptable and safe), while friends' support-seeking interactions serve as a learning experience about *responding to others'* vulnerability (meaning that reductions in vulnerability would indicate recognition of the need to leave space for discussions when friends *already* have established a capacity for vulnerability).

Developmental maturity in self-disclosure may be role-specific; for instance, perhaps in the role of support-provider, adolescents on the receiving end of vulnerable disclosure experience the expectation to *be* supportive to their friend (Saarni, 1999). It may be that adolescents who notice and manage their own emotions while responding to their friend's call for support are demonstrating greater social maturity, and facilitating true reciprocity of support in their friendships, thereby forming the building blocks of intimacy (von Salisch et al., 2014). Rather than becoming swept up in *joining* their vulnerability with their friend's vulnerability, these adolescents remain regulated, resist the urge to co-ruminate, and cede attention to the support-seeker. The current study offers simply the first step in understanding the development of self-disclosure, and future work is needed to disentangle the mechanisms that drive these associations. Even if vulnerability of a supporter begets vulnerability on the part of the support-seeker (as in Figure 1); it may be that once vulnerability has been established and demonstrated by a support-seeker (Figure 2), a mature supporter response is to restrain their own self-disclosure.

The role of gender

Gender plays a significant role in social development, as it relates to the development of self-disclosure and intimacy in close relationships. In this sample, findings were consistently stronger for girls than for boys; girls tended to show larger change in response to social input, and in general tended to disclose more than boys. These associations may be related to social expectations around vulnerability and expression of emotion, which could stereotypically discourage boys from connecting through self-disclosure (Cohen & Garcia, 2008; Connolly et al., 2018). That being said, when looking at year-to-year change, we see no significant difference in group-level changes in self-disclosure by gender. Other work has made clear that boys benefit meaningfully from their social connections, but they may seek that emotional support in different ways (Demaray & Malecki, 2002; Moran & Eckenrode, 1991). For instance, perhaps vulnerability carries different weight, risk, and reward for individuals who hold different gender identities, which may compound the impact of the developmental shift from same-gender to different-gender close relationship partners (and these power dynamics are layered with the power structures around other key identities, including race, sexual identity, and socioeconomic status; Gillespie et al., 2014). Clearly, more work is needed to disentangle

the role of gender and societal pressures in the process of developing intimacy with close relationship partners.

Adolescent moderators of self-disclosure

Furthermore, *post hoc* analyses indicated significant increases in self-disclosure by best friends from the first conversation to the second, when participants were relatively highly self-disclosing in the first conversation. These distinct processes occur for multiple interaction partners simultaneously, across different relationships, and on multiple time-scales (e.g., here, minutes and years). Future work might consider the role of various sources of vulnerable self-disclosure, the role of modeling versus direct feedback, and the role of attachment in shaping these complex developmental processes. Future work might also pursue long-term dyadic analysis of both romantic partners' self-disclosure across time, data which were not available at the time of the current study.

As indicated by *post hoc* analyses, although the adolescent's best friend in this study differed year-to-year about half of the time, patterns of increasing vulnerable self-disclosure when peers demonstrated highly vulnerable self-disclosure persisted across adolescence. Indeed, the development of participants' and best friends' self-disclosure in both supportive interactions (i.e., regardless of whether they were assigned the role of "support-seeker" or "support-provider") was *not* related to the maintenance of the same versus different best friendships year-by-year. As adolescents hone their understanding of themselves, close others, and relational processes like support-seeking and self-disclosing, they do so through a variety of interactions with many relationship partners (Mikulincer & Shaver, 2020; Vijayakumar & Pfeifer, 2020). When adolescents select friends who are similar to them, and therefore similar to one another, their developmental trajectories remain relatively smooth, likely because peers maintain similar relationship dynamics with the adolescent (Dishion et al., 1997; Loeb et al., 2018).

From adolescent friendships to adult romantic relationships

Not only do disclosure processes appear to extend across friendships, but also to future romantic relationships. Findings from this study affirm previous theories that intimacy-building process in adolescence, like vulnerable self-disclosure, establish key patterns and expectations for romantic relationships in adulthood (Sullivan, 1953/2013). In this sample, best friends' disclosure in adolescence predicted changes in participants' disclosure to adult romantic partners, such that individuals with higher-disclosing best friends increased in the amount they self-disclosed from adolescent peers to adult romantic partners. Repeated experiences with close others shape and reinforce beliefs and expectations about whether self-disclosure is appropriate, accessible, and useful in support-seeking contexts, consolidating into a framework that guides future support-seeking behaviors across time and relationships. Adolescents who learn to use vulnerability to initiate emotional conversations continue to do so in their adult romantic relationships, suggesting that the foundations of these key intimacy processes are practiced and consolidated in adolescence and persist into future relationships 16 years later. During

this socially sensitive period, peers play a meaningful role in facilitating that social learning process, in the ways they engage with and respond to vulnerable self-disclosure.

A note on low mean self-disclosure

Of note, these and all findings describe patterns in the data in which the overall mean of self-disclosure any given year was generally low, often falling between a 0 and 1. This points to one complexity in studying the development of self-disclosure: in some contexts, low self-disclosure is actually *adaptive*, to the extent that it reflects discernment and intentionality regarding the decision to self-disclose. Adolescents' ability to seek support and interact with others flexibly, and in a way that is attuned to their own needs, the needs of others, and the social context, is one of the major developmental tasks of adolescence (Hurrelmann & Quenzel, 2018). Over- and under-engaging with self-disclosure may be linked to poorer relationship health and worse psychological well-being (Schwartz-Mette, 2016). This study suggests that adolescents' best friendships serve as a meaningful social context in which to learn how to exercise vulnerability within intimate relationships.

Study limitations

Some limitations of this study warrant consideration. Most importantly, we are unable to make causal inferences based on the interrelations observed here, and unobserved processes certainly contribute to the development of vulnerable self-disclosure. Further, the observational measures used provide only a small window into adolescents' rich social lives, which vary across time, context, and interaction partners outside of the observed support task. The current study assumes that these small windows into relational processes offer important, though incomplete information about how adolescents interact with their peers. For instance, we defined self-disclosure as the single most vulnerable statement in a six-minute task to capture absolute intensity within each dyad, which limits our understanding of frequency or regularity of self-disclosure. Perhaps defining self-disclosure by the number of self-disclosing statements (rather than by the single most intense self-disclosing statement) could offer the opportunity to investigate the range of self-disclosure in a different way. Self-disclosure, as we defined it here, was based directly on level of vulnerability—meaning that when vulnerability was low or completely absent from a given conversation, a score of 0 is assigned. Future work might investigate more thoroughly these low-disclosure instances, to identify when low or limited self-disclosure may be adaptive for adolescents.

Additionally, observational data was not available for participants who did not nominate a close friend or romantic partner who was willing to participate in observational data collection. In terms of the sample, our findings are not generalizable to all dyads; for instance, the study could not examine cross-gender adolescent friendships, non-heterosexual romantic relationships, or romantic relationships shorter than three months in duration or non-monogamous, despite the significant developmental role those relationships may play. Furthermore, this study does not consider the complexity of intersectional identity factors that differently influence adolescents (for instance, gender

was coded on a binary, and other relevant identity factors, such as disability status, were not queried). Future work should consider the wide range of sociocultural contexts that reinforce or discourage vulnerability in adolescents, and how that fits differently and appropriately to different developmental contexts.

Conclusion

In sum, these findings affirm that social contexts in adolescence significantly relate to both concurrent and future social behaviors, likely through shaping adolescents' expectations of themselves, others, and close relationships. Adolescents learn about intimacy, vulnerability, and supporting one another from their friends during this sensitive period of social development. Ultimately, the ability to increase self-disclosure when seeking support and dial back self-disclosure appropriately when providing support likely reflects security-enhancing attachment processes between teens and their best friends (Mikulincer & Shaver, 2016)—attachment processes that form the foundation for healthy relationships across the lifespan. Increasingly, prevention efforts in adolescent populations consider vulnerable self-disclosure among peers as an “active ingredient” to reduce loneliness and mental health burden, by way of facilitating intimacy (Allen et al., 2021; Costello et al., 2022). While work remains to disentangle the mechanisms underlying these associations, the current findings suggest that, even outside of structured programming, attuned vulnerable exchange within close friendships may persist into adult romantic relationships.

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Open research statement

As part of IARR's encouragement of open research practices, the authors have provided the following information: This research was not pre-registered. The data and materials used in the research cannot be publicly shared but are available upon request. The materials can be obtained via email (mac4qe@virginia.edu).

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Supplemental Material

Supplemental material for this article is available online.

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