

Adolescent social learning within supportive friendships: Self-disclosure and relationship quality from adolescence to adulthood

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Abstract

This study examines links between self-disclosure and relationship quality with close friends from adolescence to adulthood. A diverse community sample of adolescents ($N=184$) participated in survey and observational measures annually from ages 13 through 29, along with their close friends and romantic partners. Random intercept cross-lagged panel modeling (RCLPM) was used to parse markers of within-individual change from age 13 to 18. Long-term longitudinal path models also investigated cascading associations among self-disclosure and relationship quality, on aggregate, from adolescence to adulthood. Adolescents who reported a higher-quality friendship in a given year demonstrated greater-than-expected increases in self-disclosure the following year, and an adolescent demonstrated high self-disclosure one year reported greater-than-expected increases in friendship quality the following year. Higher mean self-disclosure in adolescence predicted higher mean self-disclosure in adulthood. Results are interpreted as identifying high-quality adolescent friendships as key contexts for developing intimacy-building capacities (i.e. self-disclosure), which sets the stage for satisfying close relationships in adulthood.

KEYWORDS

peer relationships, self-disclosure, social support

INTRODUCTION

Across adolescence, young people engage with a major developmental task: learning to establish and maintain close, emotionally intimate friendships which ultimately serve as the template for romantic relationships in adulthood (Schulenberg et al., 2004). An increasing body of work indicates the significant mental and physical health risks associated with *lacking* these connected relationships (Allen et al., 2017; Smith et al., 2004; Valtorta et al., 2016). As the link between adolescent social development and lifelong functioning becomes increasingly clear, it highlights the need to better understand the progression of adolescent close relationships, the predictors of functioning within those relationships, and potential relational mechanisms underlying eventual flourishing and stress across the lifespan. Indeed, work has continued to call for further efforts

toward identifying and leveraging important skills and behaviors that might facilitate deeper connection long-term, particularly among young people (Costello et al., 2022; Wingspread, 2004). The current study focuses on characterizing the developing skill of *self-disclosure* across adolescence, and, in particular, its hypothesized reciprocal interaction with high relationship quality as a facilitator for adolescents' expanding capacities and comfort in social relationships.

Self-disclosure can be viewed from several perspectives: as a reflection of a personality trait (Berg & Derlega, 1987); as an interpersonal process reflecting some quality of a relationship and the individuals involved in it (Dindia, 2002); or as a tool, skill, or behavior that an individual uses to meet a social or emotional need (Franzoi & Davis, 1985). Each self-disclosing interaction can be characterized by differences in the individual, in relational quality, and sharers'

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motivations and goals (Ignatius & Kokkonen, 2007). This complexity makes self-disclosure challenging to study and has limited the amount of available literature characterizing its development (Harris et al., 1999). The current study characterizes within-individual development of self-disclosure across adolescence and then describes associations among self-disclosure and relationship quality in close relationships from adolescence to adulthood.

Within adolescence, the close friendship arises as a relational focal point; it is teenagers' first opportunity to initiate, maintain, and negotiate intimate, close, egalitarian, and non-familial relationships (Allen et al., 2021; Bowker & Weingarten, 2022). The intimacy-building process of self-disclosure—communication in which an individual shares personal or private information with a conversation partner in order to make themselves known to that other person—increases in the teenage years (Buhrmester & Prager, 1995; Pearce & Sharp, 1973). Importantly, self-disclosure is distinct from routine disclosures (i.e. sharing information about one's whereabouts or activities), due to the personal and/or private components of the information shared with an interaction partner (Tilton-Weaver et al., 2014). As such, the current study characterizes the depth of individual self-disclosure statements, to describe the degree of vulnerability an adolescent is willing to display with a close friend. The extent to which adolescents learn to self-disclose appropriately has been suggested as a key marker for teens' balancing of individuality and engagement in friendships marked by intimacy, or meaningful closeness (Bauminger et al., 2008); however, little is known about the characteristics of those close relationships that facilitate self-disclosure over time. With an eye to the potential immediate and distal impacts of adolescents' close relationships, work has time and again highlighted a need to understand how teens develop their ability to self-disclose, how that disclosure meets their social needs in the moment, and how disclosure, in turn, influences relational development (Buhrmester & Prager, 1995; Towner et al., 2022).

In this study, we focus on self-disclosure between close friends in adolescence because of the potential role these relationships play in shaping future relationship development and future disclosing behavior. Intimate, more intense self-disclosure has been proposed as important for fostering connections between conversation partners (Collins & Miller, 1994; Rose, 2002). However, the potential relational benefits of self-disclosure do not come without social risks, to which adolescents are highly sensitive (Somerville, 2013). Intimate self-disclosures are quite vulnerable, and place both teens and their close friends in an emotionally high-stakes conversation that could contribute to an individual's long-term beliefs about themselves, others, and disclosure. More vulnerable disclosure (i.e. disclosure that includes more personal information) is more likely to occur in friendships and relationships high in intimacy (Collins & Miller, 1994). The intensity of self-disclosure has been identified as particularly important for fostering intimacy and connection among conversation partners, while also carrying some significant

social risk (Rose, 2002). Here, we propose that if relationships high in closeness allow for self-disclosures, and self-disclosures foster intimacy, then that process over time likely operates in a virtuous cycle, in which both self-disclosure and relationship quality increase over time.

As described by the *Interpersonal Process Model of Intimacy* (Reis, 2017), social learning experiences—such as those initiated by vulnerable self-disclosure—can either reinforce or discourage these vulnerable behaviors, based on the way that peers respond (Mikulincer & Shaver, 2020; Stotsky et al., 2019). This social learning process is iterative, dynamic, and responsive to input from interaction partners (Costello et al., 2023; Reis, 2017). For instance, in cases where disclosure is met with understanding, teens may find the interaction reinforcing and continue to disclose in future interactions, whereas teens whose disclosure is met with rejection may not disclose again, reducing learning opportunities with that friend *and other friends* in the future (Haydon et al., 2012; Loeb et al., 2020; Reis, 2014). The current study seeks to build on this understanding by employing annual, observational measures of self-disclosure in adolescence, to characterize the conditions by which self-disclosure develops across time. Our hypotheses hinge on the idea that repeated experiences of self-disclosing to others across development hones adolescents' expectations of peers as safe (or unsafe) audiences for vulnerability, thereby facilitating (or stifling) the development of self-disclosure across the teenage years.

Further, as the second part of this virtuous circle, we hypothesize that iterative learning and intimacy-building proceed differently based on relationship quality. Adolescents in higher-quality close friendships may share more vulnerable things with their peers (Bauminger et al., 2008), ultimately offering teens and their friends more opportunities to learn how to navigate emotionally intense interactions *and* offering important information about the quality of their close friendship. By sharing personal information, individuals implicitly communicate a desire to be known, understood by, and close to a friend (Ashktorab et al., 2017; Liu & Brown, 2014). In high-quality friendships, such vulnerable disclosures may be more likely to elicit responsiveness, furthering and maintaining long-term closeness (Reis & Shaver, 1988; Roberts & Greenberg, 2002). Closeness and trust build individuals' ability to get emotional support, improve relationship quality, and ultimately cascade forward into future relationships when disclosers view their friend or partner's responses as validating, caring, and supportive (Cordova & Scott, 2001; Laurenceau et al., 2005; Reis & Shaver, 1988). In this study, we seek to test this hypothesis that high-quality relationships provide a context for the practice and development of self-disclosure.

Self-disclosure also plays a significant role in developing and maintaining intimacy in key adult relationships. As adolescents transition into young adulthood, the relational focus shifts again, and emotional support and intimacy processes primarily take place within romantic relationships (Bornstein et al., 2013). Intimacy within romantic relationships is highly valued and often strongly associated with

relationship satisfaction (Reis et al., 2004). The *Interpersonal Process Model* theorizes that intimacy (and the associated relationship satisfaction) arises from partners' responsiveness elicited by self-disclosure (Reis, 2017). From this perspective, self-disclosure provides an opportunity for such responsiveness to occur, ultimately (when that responsive behavior occurs) facilitating greater intimacy, responsiveness, and self-disclosure between those partners in the future. Considering the theorized importance of self-disclosure in prompting that intimacy, this study seeks to describe the role that developing adolescent self-disclosure capacity may play in shaping self-disclosure behaviors in romantic relationships in adulthood.

Previous work has described the extension of behaviors developed in adolescent friendships to adult romantic relationships. The term "chumship" has been used to highlight the unique importance of the close friendship in shaping adolescents' understanding of themselves and others in relationships (Furman et al., 2008). Chumships have been identified as a pivotal relationship in which adolescents collaborate and negotiate parallel, intimate relationships for the first time (Furman, 1993). As asserted by this work, the intimate closeness within friendships in adolescence provides a foundation for intimate closeness within romantic relationships in adulthood (Reis, 2017). The current study employs longitudinal survey and observational measures of self-disclosure in order to expand upon related work which has theorized that, within close friendships, self-disclosure may serve as an important building block for the initiation and maintenance of meaningful closeness (Bauminger et al., 2008; Pietromonaco et al., 2013; Uchino, 2009).

The current study is a long-term, exploratory 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 pursue the following goals regarding understanding relationship quality and self-disclosure to close friends and romantic partners across development:

Hypotheses

1. Reciprocal predictions between self-disclosure and relationship quality will be identified across adolescence, such that when an adolescent endorses relatively higher-quality friendships one year, they will engage in relatively more self-disclosure to their close friend during support-seeking the following year.
2. Additionally, when an adolescent engages in relatively high amounts of self-disclosure one year, they will report relative increases in their friendship quality the following year.
3. Self-disclosure and relationship quality will cascade into adulthood, such that highly disclosing adolescents will disclose more in adulthood and have greater relationship

satisfaction; and adolescents with higher-quality friendships will self-disclose more and have greater relationship satisfaction in their romantic relationships in adulthood.

METHODS

Participants

This study was part of a longitudinal investigation of social development across adolescence and young adulthood. Participants included 184 seventh- and eighth graders (86 boys and 98 girls). Participants were assessed annually; this study utilizes the age 13 ($M_{\text{age}} = 13.35$, $SD = .64$) through age 18 ($M_{\text{age}} = 18.38$, $SD = 1.04$) assessments with friends as well as the age 19 ($M_{\text{age}} = 19.66$, $SD = 1.07$) through age 29 ($M_{\text{age}} = 28.59$, $SD = 1.02$) assessments with romantic partners (see Table S1 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 eligible students at the school, 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 (US Census Bureau, 1999).

Study design

Each year from age 13 to 18, target adolescents nominated their closest friend to be included in the 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 Table S2). All close 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 the survey and observational measures in sets of three-year windows (when participants were aged 18–20, 21–23, 24–26, and 27–29). Participants were invited

to complete a romantic partner visit one time within each three-year window, after participants reported a relationship of at least 3 months in duration during their annual assessment ($M_{\text{duration}} = 1.18$ years at age 19, to 4.04 years at age 29; see Table S3). This resulted in four “waves” of data collection (survey and observational measures) focused on the romantic relationship. 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. 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 ($SD = 3.84$). Relationship status and participation with a romantic partner at both time points were not associated with demographic variables or adolescent friendship quality and self-disclosure. All participating couples identified as heterosexual, although this was not a requirement to participate in the study.

Procedures

All participants provided informed assent before each interview session, and parents provided informed consent prior to age 18; participants provided informed consent before each interview session once they turned 18 years old. Interviews took place in private offices within a university academic building. 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 in support-seeking interactions (age 13–18 annually with close friends; age 18–30 every 3 years with romantic partners)

Target teens and their nominated close friends participated in an observed social interaction task in private offices within a university building annually from age 13 to 18. Target teens participated in the same task with their romantic partners again at up to four time points in adulthood. In the six-minute task, participants asked their interaction partners for advice on a self-selected topic, to approximate natural social support processes. This interaction was then coded by trained graduate student coders for the level of Self-Disclosure made by the participant, using the supportive behavior task coding system for adolescent peer dyads (Allen et al., 2001).

The Self-Disclosure code describes the level to which the teen shares information about themselves, particularly private information that would make the other person in the interaction feel as though they know the speaker better. In this coding system, a single statement that contains the highest level of self-disclosure within the interaction is scored. Scores are generated based on a combination of factors—including the intensity of affect, level of vulnerability displayed, and 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. Scores range from 0 = *brief or non-controversial likes and dislikes or wants and needs are expressed; teens are talking about their day in a way that doesn't capture much personal or vulnerable information*, to 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*. Intraclass Correlations, which measure inter-rater reliability, ranged from .69–.75, falling in the good to excellent range for this statistic (Cicchetti & Sparrow, 1981).

Friendship quality (age 13–18, annually about close friends)

Participants reported on the quality of their friendships by responding to the 40-item Friendship Quality Questionnaire annually from age 13 to 18 (FQQ; Parker & Asher, 1993). The FQQ consists of items categorized into six subscales—validation and caring, conflict resolution, conflict and betrayal, help and guidance, companionship and recreation, and intimate exchange—and includes statements such as “[Friend] cares about my feelings” and “We always tell each other our problems.” Participants respond to a total of 40 items on a Likert-type scale where 1 = *Not at all True*, 2 = *A Little True*, 3 = *Somewhat True*, 4 = *Pretty True*, and 5 = *Really True*. Composite scores were

created from the sum of all items, with negatively phrased items reverse-scored such that higher scores indicate greater friendship quality. The internal consistency for friendship quality in this sample is considered excellent (Cronbach's α s = .95–.96).

Relationship status (age 18–30, annually)

Participants reported on whether they were in a 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 within three-year time windows (age 19–21, age 22–24, age 25–27, and age 28–30; see Table S1 for mean participant and partner ages at each of these time windows), they were invited to participate in observational tasks and questionnaire measures with their romantic partner.

Romantic relationship satisfaction (age 18–30, every 3 years about romantic partner)

During each of those time windows when they qualified as “in a relationship” (i.e. maintaining a committed partner for at least three months), participants completed the Network of Relationships Inventory (Furman & Buhrmester, 1985) about their current romantic relationship. This measure includes a three-item subscale that assesses the level of satisfaction in the relationship (e.g. “How happy are you with the way things are between you and this person?”). Items are scored on a scale where 1 = *Little or None*, 2 = *Somewhat*, 3 = *Very Much*, 4 = *Extremely Much*, and 5 = *The Most*. This subscale demonstrated good to excellent internal consistency in this sample (Cronbach's α s = .85–.97).

Participant demographic information (age 13)

Participant gender identity 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*.

Broad relationship quality: peers in general (age 13–18, annually about peers in general)

For post-hoc analyses, the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987) was used annually to assess adolescents' perceptions of the overall quality of their relationship with their friends in terms of the degree of trust, communication, and alienation in the relationship. All items asked teens to reflect on their relationship with

their closest friends. A composite score was obtained from 25 five-point Likert scale items, such as “They respect my feelings” (1 = *Never true*, 2 = *Seldom true*, 3 = *Sometimes true*, 4 = *Often true*, 5 = *Almost always true*). This composite measure has been shown to have good test–retest reliability and has been related to measures of psychological well-being, self-satisfaction, decreased depression, higher likelihood of seeking social support, and less symptomatic responses to stressful life events (Armsden & Greenberg, 1987). Internal consistency in the present sample was excellent (Cronbach's α s = .92–.94).

Analytic plan

To investigate Hypothesis 1 and 2, R package *lavaan* (Rosseel, 2012) was used to construct a random intercept cross-lagged panel model (RICLPM) using Full Information Maximum Likelihood (FIML) 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 that is not distorted by between-subjects effects (Mund & Nestler, 2019). Structurally similar paths were constrained to be equal, both to improve power and investigate aggregated developmental roles of self-disclosure and friendship quality across adolescence. RICLPM 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 main effects-of-interest in the current study were the cross-lagged effects between participants' self-disclosure behaviors to friendship quality.

With regard to Hypothesis 3, we sought to understand the potential long-term links of *aggregated* self-disclosure and relationship quality in adolescents to *aggregated* self-disclosure and relationship quality in adulthood (to capture the “sum-total” of social learning experiences and how they may carry forward to adulthood, on average). We generated aggregated self-disclosure and relationship quality variables across all adolescent observations (age 13–18) and aggregated self-disclosure and relationship satisfaction variables across all adult observations (age 19–29).

RESULTS

Preliminary analyses

Means, standard deviations, and intercorrelations are presented in Tables 1–3.

TABLE 1 Means, standard deviations, N_s , and correlations among adolescent self-disclosure and friendship quality variables.

	<i>M</i> (<i>SD</i>)	<i>N</i>	2	3	4	5	6	7	8	9	10	11	12
1. Self-disclosure (age 13)	1.46 (.97)	179	.22**	.06	.22**	.15*	-.00	.21**	.23**	.19*	.12	.20*	.20*
2. Self-disclosure (age 14)	1.37 (.89)	164	—	.22**	.21*	.19*	.23*	.15*	.21**	.08	.14	.12	.09
3. Self-disclosure (age 15)	1.23 (.89)	149		—	.20*	.25**	.15	.15	.26*	.17*	.22*	.18*	.16
4. Self-disclosure (age 16)	1.16 (.95)	147			—	.15	.02	.01	.16*	.11	.14	.17*	-.03
5. Self-disclosure (age 17)	0.79 (.87)	141				—	.15	.19*	.17*	.05	-.02	.07	.07
6. Self-disclosure (age 18)	0.67 (.77)	129					—	.15	.19*	.17*	-.02	.17*	.06
7. Friendship quality (age 13)	102.21 (13.93)	182						—	.23*	.27**	.12	.27***	.37***
8. Friendship quality (age 14)	103.26 (12.98)	165							—	.54***	.38***	.48***	.48***
9. Friendship quality (age 15)	101.91 (14.50)	161								—	.59***	.57***	.56***
10. Friendship quality (age 16)	103.82 (13.44)	162									—	.68***	.55***
11. Friendship quality (age 17)	106.76 (14.24)	164										—	.63***
12. Friendship quality (age 18)	106.50 (13.96)	138											—

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

TABLE 2 Means, standard deviations, N_s , and intercorrelations among romantic partner variables.

	<i>M</i> (<i>SD</i>)	<i>N</i>	2	3	4	5	6	7	8
1. Participant self-disclosure (age 20)	0.64 (0.87)	64	.01	.14	.03	.09	.07	-.01	-.09
2. Participant self-disclosure (age 23)	0.63 (0.77)	100	—	.01	-.08	.10	.10	-.11	-.01
3. Participant self-disclosure (age 26)	0.45 (0.53)	90		—	.14	-.02	.13	-.03	-.03
4. Participant self-disclosure (age 29)	0.54 (0.57)	90			—	.21	.05	.05	-.02
5. Partner relationship satisfaction (age 20)	12.98 (2.53)	85				—	-.05	-.02	-.04
6. Partner relationship satisfaction (age 23)	12.71 (2.52)	92					—	-.02	-.02
7. Partner relationship satisfaction (age 26)	13.05 (2.33)	96						—	.17
8. Partner relationship satisfaction (age 29)	13.34 (2.32)	110							—

Note: $p > .1$ for all correlations assessed.

TABLE 3 Means, standard deviations, N_s , and intercorrelations among aggregated friendship and romantic relationship self-disclosure and relationship quality.

	<i>M</i> (<i>SD</i>)	<i>N</i>	2	3	4
1. Participant self-disclosure to close friend (age 13–18)	1.19 (.58)	183	.30***	.21*	.11
2. Self-reported friendship quality (age 13–18)	156.86 (20.02)	184	—	.07	.22**
3. Participant self-disclosure to romantic partner (age 19–29)	0.55 (.47)	136		—	-.04
4. Self-reported satisfaction with relationship (age 19–29)	12.95 (1.69)	149			—

Note: Rounded mean ages are used to describe time points; for specific mean ages see Table S1.

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

Primary analyses

Hypothesis 1. Reciprocal predictions between self-disclosure and relationship quality will be identified across adolescence, such that when an adolescent endorses relatively higher-quality

friendships one year, they will engage in relatively more self-disclosure to their close friend during support-seeking the following year.

An RICLPM was analyzed that included autoregressive and cross-lagged predictions between teens' self-disclosure when

seeking support and their reports of their relationship quality with their close peer (AIC=4931.77, BIC=4999.28, CFI=.90, TLI=.91, RMSEA=.06, SRMR=.10; see Figure 1, Table 4). Autoregressive predictions were identified within participants' self-disclosure when seeking support ($\beta = .16, p < .001$) and participants' report of the quality of their close friendship ($\beta = .62, p < .001$), such that there is a degree of continuity in adolescents' levels of self-disclosure to their close friend and friendship quality across adolescence. Adolescents who scored above their person-specific mean level of self-disclosure (or friendship quality) one year were more likely to score above their person-specific mean level of self-disclosure (or friendship quality) the next year and vice versa. Additionally, cross-lagged predictions were identified from friendship quality to participants' self-disclosure, after accounting for autoregressive stability in these constructs ($\beta = .08, p < .05$). Thus, the model supported hypothesis 1; after accounting for autoregressive associations, relatively higher friendship quality at one year predicted higher-than-expected self-disclosure the following year.

Hypothesis 2. Additionally, when an adolescent engages in relatively high amounts of self-disclosure one year, they will report relative increases in their friendship quality the following year.

Additionally, cross-lagged predictions were identified from self-disclosure to friendship quality ($\beta = .16, p < .05$; see

Model 1). Thus, the model also supported hypothesis 2; after accounting for autoregressive associations, relatively higher self-disclosure at one year predicted relatively higher-than-expected friendship quality the following year.

Hypothesis 3. Self-disclosure and relationship quality will cascade into adulthood, such that highly-disclosing adolescents will disclose more in adulthood and have greater relationship satisfaction, and adolescents with higher-quality friendships will self-disclose more and have

TABLE 4 Summary of RI-CLPM parameters: participant self-disclosure and friendship quality (FQQ).

	β	SE	<i>p</i>
Lagged parameters			
Friendship Quality $\rightarrow$ Participant Disclosure	.16	.07	.018
Participant Disclosure $\rightarrow$ Friendship Quality	.08	.04	.049
"Momentum" Parameters			
Participant Disclosure $\rightarrow$ Participant Disclosure	.16	.04	<.001
Friendship Quality $\rightarrow$ Friendship Quality	.62	.03	<.001
Covariance parameters			
Participant Disclosure $\leftrightarrow$ Friendship Quality (T1)	.25	.10	.011
Participant Disclosure $\leftrightarrow$ Friendship Quality (T2–T6)	.04	.04	.245

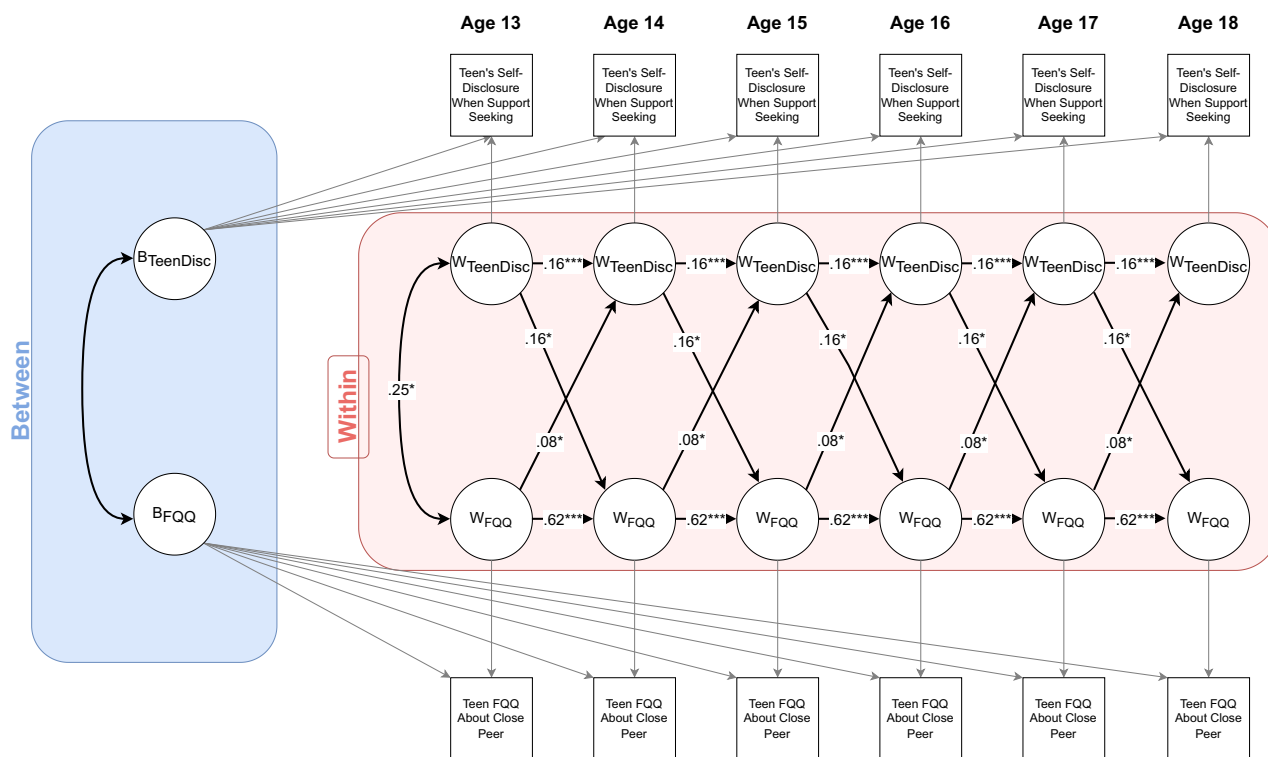


FIGURE 1 Random intercept cross-lagged panel model displaying autoregressive and cross-lagged relations between teens' self-disclosure when seeking support and their reports of the quality of their relationship with their close peer from age 13 to 18. Correlations between variables at each age not displayed for clarity. FQQ, Friendship Quality Questionnaire; TeenDisc, Observed self-disclosure.

higher levels of relationship satisfaction in their romantic relationships in adulthood.

In order to understand aggregated associations between self-disclosure and relationship quality across adolescence to adulthood, within-person means were calculated for self-disclosure and relationship quality/satisfaction from age 13 to 18 and from age 19 to 29. Then, a standard cross-lagged panel model was used to evaluate predictions from adolescent-era self-disclosure and relationship quality to adult self-disclosure and relationship satisfaction. This model identified an autoregressive association from adolescent to adult self-disclosure ($\beta = .17, p = .05$; see Table 5, Figure 2). We did not identify an autoregressive association from adolescent friendship quality to adult romantic relationship satisfaction, nor did we identify any cross-lagged associations among self-disclosure and relationship quality from adolescence to adulthood.

Post-hoc analyses

Are the close friendship findings simply a reflection of overall peer relationship quality?

In order to better understand the particular role of the close friendship versus peer relationships generally in informing

TABLE 5 Cross-lagged model parameters summary: self-disclosure and relationship quality/satisfaction from adolescence to adulthood.

	β	SE	p
Lagged parameters			
Relationship Quality (Friend) $\rightarrow$ Participant Disclosure (Partner)	-.00	.09	.98
Participant Disclosure (Friend) $\rightarrow$ Relationship Satisfaction (Partner)	.07	.09	.46
Autoregressive parameters			
Participant Disclosure (Friend) $\rightarrow$ Participant Disclosure (Partner)	.17	.09	.05
Relationship Quality (Friend) $\rightarrow$ Relationship Satisfaction (Partner)	-.01	.09	.91
Covariance parameter			
Participant Disclosure $\leftrightarrow$ Relationship Satisfaction	.14	.06	.02
Covariate parameters			
Gender $\rightarrow$ Participant Disclosure (Friend)	.36	.06	<.001
Gender $\rightarrow$ Relationship Quality (Friend)	.45	.06	<.001
Income $\rightarrow$ Participant Disclosure (Friend)	.07	.05	.30
Income $\rightarrow$ Relationship Quality (Friend)	.11	.07	.10

the development of self-disclosure, we examined an additional RICLPM capturing the participant's disclosure and an assessment of their relationship quality with peers *broadly*, as assessed by the peer scales of the Inventory of Parent and Peer Attachment. This model revealed no significant cross-lagged relationships (AIC = 4967.565, BIC = 5035.079, CFI = .885, TLI = .890, RMSEA = .065, SRMR = .102; see Figure S1; Table S4). This suggests that the patterns observed were specific to close friendships and not to broader peer relationships.

Is the association between friendship quality and self-disclosure simply a reflection of increases in intimate exchange as captured in the Friendship Quality Questionnaire?

We considered whether the *intimate exchange* subscale on the Friendship Quality Questionnaire may be driving the identified associations between relationship quality and self-disclosure. To investigate this question, we created a subscale from all FQQ items except the items that comprise the intimate exchange subscale. We then constructed an RICLPM investigating associations among self-disclosure and reported friendship quality without the intimate exchange subscale (AIC = 4976.970, BIC = 5044.484, CFI = .900, TLI = .904, RMSEA = .06, SRMR = .104; see Table S5). We identified cross-lagged associations from self-disclosure to friendship quality ($\beta = .09, p = .025$) and from friendship quality to self-disclosure ($\beta = .15, p = .021$) even after the intimate exchange subscale was removed from the measure of friendship quality. This suggests that friendship quality and self-disclosure associations were not simply driven by the explicit acknowledgment of higher- and lower-disclosure in support-seeking interactions each year.

As an additional follow-up, we also constructed an RICLPM of self-disclosure and the intimate exchange subscale (AIC = 4927.527, BIC = 4995.040, CFI = .872, TLI = .877, RMSEA = .07, SRMR = .114, see Table S6). We identified cross-lagged associations from self-disclosure to the intimate exchange subscale ($\beta = .11, p = .003$) and from intimate exchange to self-disclosure ($\beta = .26, p < .001$), following the same pattern as the other models of self-disclosure and friendship quality in adolescence. We also identified strong within-year covariance of self-disclosure and reported degree of intimate exchange in the friendship ($\text{cov}_{T1} = .35, p < .001$; $\text{cov}_{T2-T6} = .10, p = .002$), suggesting that adolescents can explicitly identify when their friends are highly self-disclosing.

What is the role of friendship stability and change?

We considered the possibility that continuity (or lack of continuity) of the close friend and romantic partner over time would moderate associations between self-disclosure and relationship quality over time. Codes were created at each

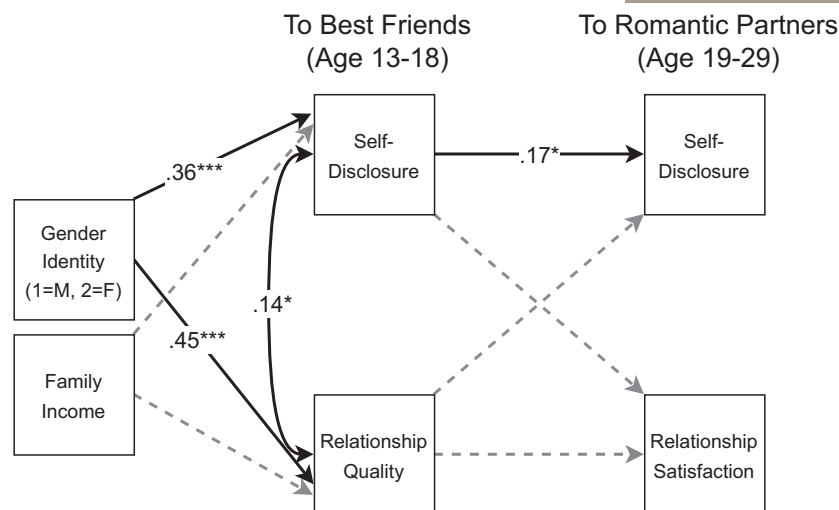


FIGURE 2 Cross-lagged model displaying autoregressive relations between teens' self-disclosure when seeking support and their reports of the quality of their relationship, on aggregate with their close peer from age 13 to 18 and their romantic partners from age 19 to 29.

wave indicating whether the same friend did (Friendship Stability = 1) versus did not (Friendship Stability = 0) participate the previous year. A series of linear regression models were run to evaluate year-by-year predictions in (1) changes in adolescents' self-disclosure based on the interaction between friendship stability and friendship quality and (2) changes in friendship quality based on the interaction between self-disclosure and friendship stability. This approach was chosen to close the approximate moderation of identified cross-lagged relations in Model 1, and because of limitations in the flexibility of RICLPM using this sample size to evaluate time-varying, manifest moderators on latent predictions (Mulder & Hamaker, 2021). No significant predictions were identified from the interaction between friendship stability and friendship quality to self-disclosure (see Tables S7 and S8).

DISCUSSION

Within adolescent friendships, a virtuous cycle appears to occur, such that adolescents in higher-quality friendships self-disclose more-than-expected in future years, and adolescents who self-disclose relatively more report subsequent relationship quality that is higher-than-expected. When looking to understand developmental interrelations among these constructs on aggregate, we see continuity over time in self-disclosure from adolescent best friendships to adult romantic relationships, and no significant cross-lagged associations among self-disclosure and relationship quality. Each of these findings will be discussed in detail below.

Adolescents in high-quality close relationships demonstrated greater-than-expected increases in self-disclosure from one year to the next, and adolescents who engaged in high self-disclosure demonstrated greater-than-expected increases in relationship quality from one year to the next. Self-disclosure, with its links to intimacy and engagement,

may be inherently encouraged, rewarded, and reinforced in high-quality relationships (Furman, 2018; Stern et al., 2021). When adolescents receive a positive response to their self-disclosure, they may be more likely to self-disclose again in the future; facilitating increased opportunity for practice negotiating emotionally vulnerable conversations. Meanwhile, in lower-quality, unsupportive, and/or invalidating relationships, the vulnerability of self-disclosure may come at a cost, and adolescents may use less self-disclosure and feel less encouraged to engage in self-disclosure in future interactions (Stotsky et al., 2019). This interpretation fits with existing theories about social reinforcement and relationship-building, and this study builds on these ideas by identifying true within-person components of social learning across 6 years of adolescence. Furthermore, in post hoc analyses, we identified friendship quality factors separate from intimate exchange also demonstrated this pattern of association with self-disclosure, suggesting that these social learning processes may be both implicit and explicit. Additionally, while a *lack* of association does not lend itself to interpretation, the combination of findings suggests that this process truly takes place within the adolescent's closest relationships, and may not reflect their relationship to peers, broadly. The close friendship, and high-quality close friendships in particular, facilitate the development of vulnerable self-disclosure in help-seeking interactions.

Secondly, patterns of self-disclosure were associated from adolescence to adulthood. This developmental cascade aligns with existing work that suggests relationship functioning in adolescence establishes a meaningful baseline that sets the stage for future functioning (Furman, 2018). Post hoc exploration of the data did not identify a significant role of friendship stability in shaping development over time. While we must be cautious interpreting a lack of statistical association, the combination of these findings suggests that adolescents' development did not proceed significantly differently regardless

of the target close friend who participated in our study. Adolescents tend to select friends who are similar to them, and therefore similar to one another (Giletta et al., 2021). The common thread of the focal adolescent, and their gradual social development, may maintain similar interaction dynamics over time (Mikulincer & Shaver, 2010). Previous work has questioned whether the skills developed in same-gender friendships can directly translate to cross-gender romantic relationships, or if teens must adapt those skills as the focal relationship changes (Connolly et al., 2015). Findings from the current study suggest that developing interpersonal abilities in adolescence may lend themselves to more evident support within a future romantic relationship; reinforcing the idea that skills developed in adolescent friendships are generalizable (Allen et al., 2020). Thus, this study adds to the existing work suggesting that interpersonal processes in adolescent friendships set the stage for relationship functioning in adulthood (Furman, 2018).

In combination, these findings point to adolescence as a trajectory-setting time period: self-disclosure and relationship quality both demonstrated significant stability from adolescence to adulthood, even after accounting for major covariates often used to explain such stability. Adolescents learn about vulnerability within close friendships. Importantly, these analyses do *not* suggest that adolescents demonstrate one propensity or the other (to share extensively or to withhold vulnerability altogether). Rather, these findings support that a complex developmental process is at play across adolescence, and that teens at any given point in adolescence have the opportunity to practice and learn new social skills given a supportive social environment and new social information. Prevention programs acknowledge this phenomenon, and work to scaffold safe, vulnerable connections among young people with some success (Allen et al., 2021; Costello et al., 2022). Given the degree to which adolescent supportive experiences form the foundation for relational health, long-term, it is imperative that we build our understanding of the relationship dynamics underlying these developmental processes (Allen et al., 2023).

Limitations

As we make these inferences, limitations of this study warrant consideration. Most importantly, we were unable to make causal inferences based on the interrelations observed here. With regard to the method, the RICLPM approach used here cannot estimate random slopes, limiting our ability to account for between-person differences in individual trajectories. Additionally, unobserved variables or processes likely underlie the predictions identified by these models. For example, this study does not capture the childhood roots of self-disclosure and support-seeking behaviors. It is likely that parental behaviors and responsiveness inform and shape adolescents' early propensities toward vulnerability with their friends—propensities

which are key to the iterative learning model proposed here. Future work could integrate measures of early parent- and peer-directed vulnerability and support to explore early relationship conditions that might facilitate effective interpersonal vulnerability in childhood. Additionally, the current study operates under the assumption that these observed “windows” into relational processes offer important, though incomplete information about how adolescents interact with their peers. For instance, we defined self-disclosure in terms of the most vulnerable statement in a six-minute task, which limits our understanding of frequency or regularity of self-disclosure, in order to capture absolute intensity within each dyad.

In terms of the sample, our findings are not generalizable to all dyads; for instance, the study imposed the gender identities of “male” and “female” on participants and does not consider individuals who do not identify with other identities. We also do not examine any cross-gender adolescent friendships, any romantic relationships that do not identify as heterosexual, and any romantic relationships that were shorter than 6 months in duration or non-monogamous, despite the significant developmental role those relationships may play. Additionally, beyond our knowledge that all couples identified as heterosexual, we did not assess other aspects of the romantic partners' identities. Future work should consider a wider range of sociocultural contexts and factors that reinforce or discourage vulnerability in adolescents, and how that fits distinctly in different developmental contexts. Self-disclosure may develop differently depending on the types of stressors adolescents face and the extent of alternative sources of support and stress in their lives. Additionally, future work would be bolstered by considering the role of changing close friendships and romantic partnerships in shaping self-disclosure tendencies. Although attachment frames-of-mind are shaped by many relational inputs across the lifespan, perhaps friendship stability or instability serves a particular function in developing comfort with vulnerability (or, alternatively, perhaps it may be an indicator of challenges in developing intimacy).

Future directions

This study also raises other relevant questions for the study. For example, work focusing on co-rumination has identified the risk for immediate downturns in well-being when adolescents discuss problems extensively and without a solution (Rose, 2002). In this work, even though these friendships may *feel* connected and supportive, both adolescents leave conversations with more negative mood symptoms (Rose, 2021). It will be important to continue to develop an understanding of co-rumination and supportive processes in order to identify the costs and benefits of self-disclosure to others in these vulnerable conversations (for instance, perhaps there is support-seeking “sweet spot” in adolescence, prior to a point at which sharing becomes *too* emotionally intense for friends to manage effectively). Additionally, 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. Looking further, to adult-era processes: this study had a limited sample size to pursue investigation of trajectories of self-disclosure and relationship satisfaction in adulthood, and future work should consider the role of relationship stability or change as a moderator (or outcome) of these processes. Similarly, other work might consider the role that co-parenting processes may play to amplify or attenuate sharing and relationship quality processes between romantic partners. Parenting stress has been shown to temporarily hamper relationship satisfaction within relationships of new parents (Bouchard, 2016)—perhaps self-disclosure between partners could facilitate continued intimacy as they navigate the transition to parenthood.

CONCLUSION

In conclusion, adolescents learn about sharing and supporting from their friends. They learn to share more when conversations are safe and encouraging, and to use self-disclosure as a tool for building closeness, connection, and support. Considering the natural human drive for connection and the potentially far-reaching consequences of isolation (Allen et al., 2017; Smith et al., 2004; Valtorta et al., 2016), work has continued to trend toward identifying and leveraging important skills and relational processes that might facilitate connection long-term (Wingspread, 2004). This study indicates that developing the capacity to use self-disclosure in adolescence may set the stage for self-disclosing throughout the lifespan, facilitating high-quality close relationships. More broadly, we find evidence that interaction patterns, expectations of relationships, and individual tendencies toward vulnerability are learned and reinforced in adolescence, establishing (or inflecting) trajectories that persist into adulthood.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare that are relevant to the content of this article.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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