# Navigating Adolescence: The Dynamics of Dyads, Perception, and Personality in Youth Development

by

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# DISSERTATION ABSTRACT

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Title: Navigating Adolescence: The Dynamics Of Dyads, Perception, and Personality in Youth Development

Adolescence is a critical period during which close relationships and emerging self-perceptions shape emotional well-being and personality development. Yet existing research has relied heavily on aggregated, retrospective, and between-person methods that obscure the specific perceptual processes through which these effects operate.

The goal of this dissertation was to examine perceptual processes during adolescence across three complementary studies. Study 1 used a daily diary design to show that specific friendship experiences – particularly feeling supported, valued, and rejected – carried distinct affective consequences for adolescent girls that composite measures of friendship quality would have obscured. Study 2 examined parent-child agreement in perceptions of parenting behavior across middle childhood to late adolescence in Mexican-origin families, finding that agreement was moderate on average but varied meaningfully by parenting domain, gender dyad, and informant type. Study 3 used random intercept cross-lagged panel models to show that agreeableness predicted subsequent changes in adolescents' domain-specific self-perceptions, while self-perceptions showed little evidence of forecasting later personality change. Together, these findings advance developmental theory by demonstrating that perception is not a passive reflection of adolescent experience, but an active process through which development unfolds. Understanding it requires specificity, within-person designs, and attention to timescale.

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# CHAPTER 1 - LITERATURE REVIEW

## Introduction

Consider Maia, a 14-year-old who carries an internal map of who she is. She is competent academically, unconfident about her appearance, conscientious but not outgoing. The map – her internal sense of who she is across the different areas of her life – has shifted over the years in ways she cannot entirely explain. She also sees herself as responsible and mature, though her mother disagrees. Her mother still sends reminders, still checks in, still monitors her whereabouts and daily activities. On a Tuesday, Maia's closest friend cancels plans without explanation and she spends the whole day feeling rejected. On Wednesday, the same friend sends a long, thoughtful text and Maia's mood lifts noticeably. Each of these dynamics involves perception – of oneself, of a close relationship, of how one is seen by others – and each raises questions the existing literature has not satisfactorily resolved.

Maia's experiences illustrate the central concerns of this dissertation. Adolescence is a critical developmental stage (Crone & Dahl, 2012; Dahl et al., 2018) where identity formation, autonomy, and social relationships come to the forefront (Branje, 2022; Chu et al., 2010; Crosnoe, 2000; Eccles et al., 1991; Smetana, 2017). It is also a period of significant development in social cognition – the processes by which people perceive, interpret, and make sense of themselves and others (Blakemore & Choudhury, 2006; Burnett & Blakemore, 2009; Pfeifer & Blakemore, 2012). Advances in perspective-taking, self-reflection, and sensitivity to social feedback during adolescence reshape how young people understand themselves and their relationships, making this a particularly consequential window for examining how perceptual processes operate and what they mean for development (Sebastian et al., 2008; Steinberg & Morris, 2001). At the intersection of personality psychology and developmental psychology lies

a significant but underexplored set of questions about how adolescents perceive themselves and their close relationships, and what those perceptual processes mean for who they are becoming. How do relational experiences shape emotional functioning, and does it matter whether we examine them as stable impressions or as they unfold moment to moment? How do the perspectives of adolescents and close others converge or diverge, and what are the consequences of that gap? And how do the ways adolescents see themselves across different domains of their lives relate to the broader personality traits they are developing over time? These questions implicate risk for depression and anxiety, the quality of parent-child and peer relationships, and the mechanisms through which adolescence shapes who people become.

The core problems are not gaps with regards to topics left unstudied, but methodological and conceptual challenges embedded in the design and interpretation of existing work. They include aggregate quality indices that can suppress or invert real effects; longitudinal designs that mistake between-person correlations for within-person dynamics; and measures insufficiently distinct from the trait constructs they are supposed to predict.

The present dissertation addresses these gaps through three empirical studies that examine perceptual processes during adolescence from complementary angles. In Study 1, I use a daily diary design to examine how specific daily friendship experiences, such as feeling supported, rejected, or secure, related to adolescent girls' daily affective states in real time. In Study 2, I examine parent-child agreement in perceptions of parenting behavior and relationship quality across middle childhood to late adolescence in Mexican-origin families, focusing on how discrepancy is operationalized and what informant asymmetry means for interpretation. In Study 3, I examine how domain-specific self-perceptions relate to personality traits longitudinally, asking whether personality traits predict subsequent changes in self-perception or vice versa, and

whether those effects reflect stable between-person differences or dynamic within-person processes, a distinction prior longitudinal work has not been designed to make. Together, these studies advance understanding of how adolescents perceive themselves and their close relationships, and what these perceptual processes mean for emotional well-being and personality development.

This review builds the theoretical and empirical foundation for the three studies. The first section examines how adolescents perceive themselves, attending to what is known and to the limits of existing evidence. The second examines how close others perceive adolescents and how agreement between self- and other-perception is conceptualized, measured, and interpreted. The third section addresses what happens when those perceptions diverge, for both relationship quality and mental health. The fourth argues that understanding these processes requires attention to timescale – that stable impressions and daily fluctuations are distinct objects of inquiry with important consequences, and explains why cross-sectional and global-retrospective methods are structurally mismatched to the phenomena they aim to study. Across these themes, I identify key gaps that the three empirical studies are designed to address.

## How adolescents perceive themselves

### Structure of adolescent self-perception

Self-perception – how people interpret their own emotions and traits – in adolescence is not a unitary phenomenon, although at times, the literature has treated it as such. Research has collapsed diverse self-evaluations in global self-esteem indices, obscuring meaningful structure. Adolescents differentiate their self-concepts across domains, including scholastic competence, social acceptance, athletic ability, and physical appearance, and this differentiation increases with

development as adolescents recognize that competence in one area implies nothing about another (Harter, 2012b).

The distinction between global self-worth and domain-specific self-concept carries underappreciated consequences. The significance an adolescent assigns to a domain moderates how much it shapes their overall self-esteem (DuBois et al., 1998; James, 1968). An adolescent who does not care about athletics will not suffer self-esteem decrements from athletic failure but one whose identity is organized around athletic performance will. Global self-esteem scores are therefore composites of differently weighted components. Studies using global self-esteem as a predictor or outcome cannot recover information about which domains are driving observed associations. Two adolescents with identical global self-esteem scores may derive that sense of worth from entirely different sources – one from contentment with physical appearance and another from social competence, profiles with potentially distinct implications for adjustment that a global score obscures completely.

The developmental trajectory of self-concept further complicates interpretation. During early adolescence, the focus is interpersonal attributes, social skills, and emotions, with teenagers recognizing they may present different selves in various contexts (Harter, 2012a). By middle adolescence, they become increasingly introspective and often preoccupied with others' opinions. In late adolescence, the emphasis shifts to personal beliefs, values, and moral standards (Harter, 2012a). The same self-report measure administered at different developmental moments is therefore capturing meaningfully different cognitive and emotional processes. The field has largely set aside this measurement invariance problem.

**Limitations in self-perception accuracy**

Self-knowledge is constrained in patterned and not random ways. The accuracy of person perception is best summarized by the Realistic Accuracy Model (RAM; Funder, 1995, 2012), which delineates three key components: relevance, availability, and detection. Relevance suggests that accurate judgements are more likely when observed cues are pertinent to the specific personality trait in question. Availability underscores the importance of having access to relevant information for accurate assessments. Detection is the noticing, attending to, and interpreting available cues. While RAM is widely used to explain perception accuracy, it does not fully account for motivational biases that may distort perception even when relevant cues are available (West & Kenny, 2011), nor does it explicitly address situational constraints that may prevent people from expressing or detecting personality traits accurately (Letzring, 2008).

Self-perception has been extensively studied, yet its accuracy is limited by biases, cognitive processes, and external influences (Vazire & Carlson, 2010). People possess a superior capacity for self-evaluation due to the accessibility of all relevant cues, however this does not guarantee accuracy of self-perception. Cognitive biases including confirmation bias (Klayman, 1995), self-serving bias (Sedikides et al., 1998), and fundamental attribution error (Gilbert & Malone, 1995), introduce systematic inaccuracies in the judgement process. Further, these biases do not operate uniformly across trait domains (Vazire, 2010). The field has not fully absorbed these asymmetries into how self-perception research is designed in that most studies treat self-report as a reasonable approximation of trait standing rather than as a systematically biased estimate that varies in accuracy depending on what is being measured.

A separate but related limitation concerns how the valence of self-perception shapes the information subsequently taken in. Low self-esteem is not just an affective state but a cognitive

orientation (Fennell, 1997). Self-esteem both shapes and is shaped by self-perception, consisting of attitudes and beliefs about oneself, whether positive or negative (Fathi-Ashtiani et al., 2007). People with low self-esteem may discount positive feedback from others, suppress positive emotions, and feel unworthy of good outcomes, increasing their risk of depression (J.V. Wood et al., 2003, 2009). These patterns are self-reinforcing and low self-esteem predicts increases in rumination, which in turn predicts subsequent increases in depression (Kuster et al., 2012), which presumably deepens negative self-evaluation. High self-esteem, conversely, may reduce the need for constant validation, allowing adolescents to maintain a more stable self-concept less dependent on how others see them (Kernis, 2003). The field has treated these relationships as moderation rather than as a dynamic system. How self-perception feeds back into personality development more broadly remains underexplored.

**What global assessment misses**

The deeper methodological issue is the heavy reliance on global retrospective self-report. When adolescents rate their social competence or scholastic ability, they are not retrieving a stored summary but are constructing an estimate by sampling from memory, a process distorted by current mood, reconstruction biases, and the disproportionate weight of recent and salient experiences (Schacter et al., 2011; Solomon & Vazire, 2014). Global retrospective reports compress temporal variation into a single number, concealing whether self-perception is stable across days or highly variable. This matters because independent of mean level, self-esteem instability predicts distinct outcomes, including hostility and vulnerability to depression (Kernis, 2003). Studies using single time-point or widely-spaced longitudinal assessments cannot detect this instability. A stable high and an unstable high score are captured identically, meaning studies

may attribute effects that are driven by variability to mean level effects, or fail to detect effects that only emerge when variability is measured directly.

## How others perceive adolescents

### Parents as perceivers

Parents occupy a theoretically privileged position as perceivers of adolescents. Long acquaintance, repeated interaction across contexts, and strong motivation to understand their children should support relatively accurate perception (Funder, 1995, 2012). But parental perception is subject to systematic biases the literature has not fully theorized. Parents hold prior beliefs about their children's traits, and these prior beliefs drive confirmation-biased processing of new behavioral evidence (Darley & Fazio, 1980; Johnston & Ohan, 2005).

The implications for informant-report research are underappreciated. The field typically treats parent and adolescent reports as two imperfect windows onto the same behavioral reality (Hou et al., 2020). But if parental perception is systematically biased toward viewing parenting as more supportive and less controlling than it is experienced, then the two reports are not noisy reflections of a shared truth. They reflect different constructed realities, shaped by different motivational orientations. The field has no satisfying answer to this, and most research proceeds without pause.

### Disagreement as data

The large body of research on parent-child agreement treats informant discrepancy as a problem to be explained – miscommunication, developmental strain, autonomy conflict – without grappling with the possibility that both reports reflect genuine but distinct realities. The most common pattern is that adolescents report less warmth and more control than parents report (Hou et al., 2020). This could be produced by three mechanisms. Adolescents may be sensitized

to parental control behaviors as they work to assert their own autonomy, perceiving those controlling behaviors with greater salience than parents intend (Kakihara & Tilton-Weaver, 2009; Smetana, 2017). Parents may be self-servingly optimistic, presenting their parenting more favorably than behavior warrants. Or both perspectives may be internally valid, in which case there is no single behavioral reality that either informant describes more accurately. In such cases, the same behavior carries genuinely different meaning depending on who experiences it. The literature gestures toward all three possibilities without building a framework capable of distinguishing them.

The dominant method of studying discrepancies is predicting outcomes from dyadic discrepancy scores; this compounds the interpretive problem by adding a statistical one. Difference scores carry well-documented statistical liabilities including reduced reliability, artificial confounding with mean, and regression to the mean (Edwards, 1994; Griffin et al., 1999). They also carry the deeper problem that the discrepancy source and direction are unspecified. When larger discrepancies predict worse adolescent outcomes, the mechanism is indeterminate. Conflict could drive disagreement, disagreement could drive conflict, or both could reflect unmeasured third variables. An alternative approach does not subtract one informant's report from the other's but instead models the two reports in relation to each other, asking how closely ratings track each other across domains and over time, rather than collapsing alignment into a single number whose meaning is unspecified.

The additional complication is that disagreement is not uniformly maladaptive. Moderate discrepancies may reflect normative developmental individuation rather than relational dysfunction (Laird & LaFleur, 2016). If discrepancy sometimes predicts negative outcomes and sometimes does not, the moderating conditions must be specified before the basic pattern is

interpretable. The field has acknowledged this without identifying those conditions systematically.

## What happens when perceptions diverge

### Relationship quality

Disagreements in personality perception between adolescents and their parents can have diverse effects on relationship quality not because either is entirely wrong, but because the gap between their views generates misunderstanding and conflict. Positive parent-child relationships, marked by effective communication, warmth, and responsiveness, foster understanding, trust, and problem-solving (Butterfield et al., 2021; Lippold et al., 2016). When adolescents and their parents disagree in their perceptions of parenting behaviors and relationship quality, it tends to predict poorer relationship outcomes. These strained relationships can, in turn, contribute to various mental health issues (Hou et al., 2020). There is an increasing alignment of perspectives on parenting behaviors as adolescents near adulthood (Mastrotheodoros et al., 2019), but the circumstances under which this convergence occurs, and whether it is more likely in some families than others, remains an important open question.

### Mental health consequences

Moderate perception differences may not harm well-being and can even promote adaptive coping, but persistent or extreme discrepancies can contribute to depression, anxiety, or other internalizing difficulties. If an adolescent notices a large gap between how they see themselves and how their parent or friend sees and values those same traits, it can make them feel inadequate and lower their self-esteem (James, 1968). The vulnerability model treats persistently low self-esteem as a risk factor for depression (Orth & Robins, 2013). The self-discrepancy theory further elaborates on this by explaining that the difference between an individual's actual self and

their ideal or ought self can cause emotional distress, particularly when accompanied by low self-esteem (Higgins, 1989; Mason et al., 2019).

Neither framework addresses the temporal grain at which these processes operate. Both treat self-discrepancy as a stable individual characteristic and predict chronic outcomes from it. But the gap between actual and ideal self may fluctuate meaningfully in response to daily relational experiences – whether an adolescent felt valued or overlooked, supported or criticized, included or excluded on a given day. If self-discrepancy is dynamic rather than fixed, chronic-level measures miss the proximal mechanism. Daily assessment of relational experience becomes theoretically necessary, not merely methodologically motivated.

The gender distribution of internalizing risk provides important context. Girls are approximately twice as likely as boys to develop depression and anxiety, with this divergence emerging in early adolescence and sharpening through mid-adolescence (Hankin et al., 2010; Salk et al., 2017). The mechanisms most consistently implicated are girls' greater emotional investment in close dyadic friendships, elevated sensitivity to interpersonal feedback, and greater tendency toward co-rumination – repeated joint discussion of relationship problems that amplifies rather than resolves negative affect (Rose, 2002; Rose & Rudolph, 2006). This profile makes daily friendship experiences differentially consequential for emotional functioning of girls.

## Why timescale matters

A persistent structural problem across the adolescent development literature is answering within-person questions with between-person data. Most research measures individuals at one or a few widely spaced time points and analyzes between-person associations, such as: do adolescents with more positive friendship quality show better emotional outcomes? While a valid

question, at times it is interpreted as addressing a different question: does improving friendship quality for a given adolescent improve their emotional functioning? That is a within-person question that between-person data cannot provide an answer to. Associations that hold across people do not necessarily hold within them, and in many domains, the two diverge in magnitude and sometimes direction (Hamaker, 2025; Molenaar, 2004, 2008; Speelman et al., 2024). Two adolescents may report similar average friendship quality, yet one experiences stable, consistent support across days while the other oscillates between feeling deeply supported and feeling isolated. Between-person designs treat them identically. Variability in relational experience may itself predict emotional functioning, independently of the mean, just as self-esteem instability predicts outcomes independently of mean self-esteem (Kernis, 2003). Adolescent research that ignores variability misses a meaningful source of individual differences in adolescent emotional vulnerability. The problem is not only that variability goes unmeasured but also that mean-level indices are typically measured in ways that obscure what is driving the effect.

Composite indices are a recurring feature, and a liability, of the adolescent development literature. When diverse features are collapsed into a single score, the assumption is that those features vary together and carry equivalent psychological weight (Mõttus et al., 2019). Neither assumption is generally justified, and the cost of getting it wrong causes the systematic erasure of effects that can only exist at the level of specific features. When differently-valenced components partially cancel each other out, aggregation can suppress real effects entirely, producing false null findings where feature-level analysis may find a significant effect. A global score that masks domain-specific variation can predict outcomes at the aggregate level while concealing the specific source of that prediction (J. Cohen et al., 2015). The problem is exacerbated when composite scores are then used to predict outcomes, because the mechanism

(which features, in which direction, and for whom), remains unidentified regardless of whether the composite is a significant predictor. More data collected with the same aggregation strategy will not resolve the challenges and will only replicate findings that cannot be interpreted.

## Conclusion

Each of Maia's three dynamics – the Tuesday she felt rejected by her friend, the ongoing tension with her mother about responsibility and monitoring, and the slow evolution of her domain-specific self-perceptions – illustrates a distinct point at which perception shapes adolescent experience in ways the existing literature has not fully captured. What these dynamics share is that they operate at a level of specificity, on a particular day, within a particular relationship, across a particular domain, that broad or aggregated measures are not designed to detect. Understanding how perceptual processes function at that level of granularity is essential for identifying when and why they carry consequences for emotional well-being and development. My dissertation addresses this by examining perceptual processes during adolescence from three complementary angles: how specific relational experiences shape affect in real time, how parents and adolescents come to see parenting differently across development, and how self-evaluations and personality traits relate to and influence one another over time. Together these studies treat perception not as a backdrop to adolescent development but as a process through which development actively unfolds.

## Overview of studies and aims

The overarching goal of this dissertation was to examine perceptual processes during adolescence and what these perceptual processes mean for emotional well-being and personality development. Across three studies, I investigate how specific relational experiences shape adolescent affect in real time, how the perspectives of adolescents and close others converge or

diverge, and how adolescents' self-evaluations and personality traits relate to and influence one another over time. I addressed these questions across samples of adolescent girls and Mexican-origin youth, as adolescence is a particularly consequential period for the development of self-concept, close relationships, and personality, and individual differences in perceptual processes during this window may have lasting implications for well-being.

**Study 1**

The goal of this study was to examine how specific daily friendship experiences relate to adolescent girls' daily affective states. Using a daily diary design, 90 adolescent girls reported over approximately 30 consecutive days on specific positive and negative experiences within their single closest friendship, such as feeling supported, rejected, secure, or lonely, and on affective states including depressed, anxious, happy, and self-confident. Multilevel models controlled for prior day's affect.

**Study 2**

The goal of this study was to examine parent-child agreement in perceptions of parenting behavior and relationship quality across middle childhood to late adolescence in Mexican-origin families. Using longitudinal data spanning ages 10 to 17, we estimated the degree of perceptual alignment across multiple parenting domains, including warmth, hostility, monitoring, and relationship quality, and tested whether agreement varied by construct, informant type, gender, and age. Reports were obtained from adolescents, mothers, and fathers.

**Study 3**

The goal of this study was to examine how domain-specific self-perceptions relate to Big Five personality traits across adolescence, and to determine the direction of effects over time. Using random intercept cross-lagged panel models across five waves of longitudinal data, we

tested whether personality traits predicted subsequent changes in self-perception, whether self-perception predicted subsequent personality change, and whether observed associations reflected stable between-person differences or dynamic within-person processes.

Together, these studies advance understanding of adolescent development by treating perceptual processes, at the daily level, the relational level, and the trait level, as primary objects of inquiry rather than statistical nuisances.

# CHAPTER 2 - STUDY 1

# DAILY ASSOCIATIONS BETWEEN CLOSE FRIENDSHIP EXPERIENCES AND AFFECTIVE STATES IN ADOLESCENT GIRLS

Amala Someshwar, Sara J. Weston, Hannah L. Schacter, Jennifer H. Pfeifer

**Abstract**

Although close friendships are known to promote adolescent girls' psychological well-being over time, there is a gap in our understanding of how specific daily friendship experiences shape adolescents' emotions in real time. Using a daily diary approach, 90 female adolescents (M age = 16.67 years) reported over approximately 30 consecutive days on positive and negative experiences within their single closest friendship–such as feeling supported, valued, rejected, or lonely–and on daily affective states including depressed, anxious, happy, and self-confident. Multilevel models controlled for prior day's affect, and time in study. Positive daily friendship experiences, particularly feeling supported, valued, understood, and secure, were consistently associated with higher same-day happiness, joy, and self-confidence. Negative experiences, such as feeling rejected, lonely, or stressed, though less frequent, were associated with higher daily depressed affect and stress, and lower happiness. No significant associations emerged for anxiety, excitement, or sleepiness after correction for multiple comparisons. In a subsample who also reported daily romantic relationship experiences (*N = 31*), friendship effects were largely attenuated when romantic experiences were included as a covariate, while a small number of friendship × romance interactions suggested these two relational contexts can moderate one another's associations with affect. These findings should be interpreted cautiously given limited statistical power. Together, these results highlight the importance of distinguishing between specific daily friendship experiences, as different experiences carried distinct affective

consequences, and underscore that even subtle daily shifts in friendship dynamics can shape adolescents' emotional well-being.

*Keywords:* adolescent, daily friendship, daily diary, daily affective state

## Introduction

Adolescence is a period of heightened emotional sensitivity and social reorientation, during which close friendships become central to psychological well-being (Narr et al., 2019; Poulin & Chan, 2010; Wood et al., 2017). Extensive research shows that adolescents' overall friendship quality shapes emotional adjustment (Schwartz-Mette et al., 2020a). Yet although theories emphasize that friendships consist of multiple distinct features (Berndt, 1982) and can fluctuate over time (Bowker & Weingarten, 2022), few studies have examined how multiple, specific daily friendship experiences relate to adolescents' emotional well-being in real time.

The present study examines how adolescent girls' daily friendship experiences relate to daily affective states using a daily diary design to capture within-person variability. We conceptualize friendships as dynamic systems, where daily reports reflect relationship-relevant events and perceptions as they occur. The overall tone of any close relationship demonstrates the accumulation of thousands of micro-level interactions within a specific dyad. Over time, these repeated exchanges consolidate into relatively stable expectations and emotional patterns, similar to how attachment relationships are constructed through recurring caregiver-child interactions (Cassidy et al., 2013; Thompson et al., 2022). As these momentary inputs accumulate, they coalesce into deeper relational bonds characterized by intimacy and companionship (Baker, 1983; Berndt, 2002; Bukowski et al., 2020; Seyfarth & Cheney, 2012). Drawing on past theory and emerging evidence, we investigate how distinct experiences within friendships–such as feeling supported, rejected, secure, or jealous–can vary daily for adolescents. This daily-level

approach captures the fluidity of adolescent friendships and can offer insight into how momentary shifts in friendship experiences shape emotional functioning.

**Beyond static measures of friendship: Capturing temporal dynamics**

Classic developmental theories highlight friendships as central to adolescents' social and emotional adjustment. The emergence of intimacy in peer relationships marks a key milestone of adolescence (Sullivan, 1953). Friendships are multifaceted, involving distinct features such as support, loyalty, and intimacy, which promote competence and self-esteem, as well as negative features such as conflict or rivalry, which predict distress (Berndt, 2002; Hartup, 1992, 1998). However, few studies have examined how these features unfold in adolescents' daily lives and how experiences like support or jealousy shape mood from day to day.

The question of how daily friendship experiences shape affect is especially salient for girls, who tend to form emotionally intimate, dyadic friendships characterized by empathy and self-disclosure (Rose & Rudolph, 2006). While these relationships provide emotional resources, they may also heighten vulnerability to interpersonal stress, particularly given girls' greater tendency than boys toward co-rumination (Rose, 2002). Girls are also twice as likely as boys to experience anxiety and depression, with sex differences emerging in early adolescence and intensifying by mid-adolescence (Hankin et al., 2010; Kessler et al., 2003; Salk et al., 2017). Understanding specific friendship processes that support or undermine well-being is therefore crucial during early-to-mid adolescence.

Contemporary frameworks increasingly conceptualize friendships as temporally dynamic systems (Bowker & Weingarten, 2022). Girls' daily experiences of support, exclusion, or jealousy may shift meaningfully across days, with immediate implications for emotional well-being. However, friendship quality is often assessed using global self-report measures that

capture adolescents' overall perceptions of their friendships (Gaertner et al., 2010; Schwartz-Mette et al., 2020a). Although informative, these aggregated reports may obscure short-term variability and reflect general relational impressions rather than day-to-day fluctuations. An adolescent may feel deeply supported one day and excluded the next–fluctuations that global measures are not designed to capture. Moreover, global summary reports often require adolescents to integrate experiences across time, a process that can be influenced by reconstruction biases, current mood, and social desirability concerns (D. L. Schacter et al., 2011; Solomon & Vazire, 2014). These limitations underscore the need for daily-level assessments to capture fine-grained fluctuations in friendship dynamics.

Longitudinal research shows that individual differences in friendship quality shape adjustment outcomes among adolescents. For example, high-quality friendships predict higher levels of self-esteem and lower distress over years (de Moor et al., 2021; Li et al., 2025; Pickard et al., 2018; Way & Greene, 2006). Although measurement intervals of a year or more yield insights into the long-term effects of friendship quality on well-being, they do not capture the day-to-day emotional impact of specific friendship experiences. Some research has begun to narrow this temporal gap by examining friendship quality at shorter intervals: monthly increases in friendship quality have been linked to changes in depressive symptoms through insecurity and self-esteem (Li et al., 2025). Yet even monthly assessments may obscure finer-grained fluctuations in how adolescents experience their friendships from day to day. Daily diary designs therefore offer an ecologically valid method for capturing friendship dynamics as they unfold (H. L. Schacter et al., 2024).

Indeed, there is emerging empirical evidence suggesting that daily peer experiences predict changes in emotional functioning. For example, momentary general social connectedness

predicts lower negative affect in girls (Do et al., 2025), and daily conflict with friends predicts increased negative affect the following day, with bidirectional feedback loops between emotion and interaction (Vannucci et al., 2019). Daily support and co-rumination likewise shape mood and physiological regulation, though the direction of effects is not always clear. Co-rumination with a close friend predicted within-day mood worsening after controlling for morning mood, offering a strong directional case (White & Shih, 2012). Daily friend and parent support each predicted increases in happiness and social connectedness, though reverse causation cannot be ruled out even with prior-day well-being controlled (H. L. Schacter & Margolin, 2019). Daily provision of emotional support to friends also predicted lower cortisol the following morning, extending these effects to physiological as well as emotional outcomes (Armstrong-Carter & Telzer, 2021). These patterns emphasize the need to extend from trait-level and/or between-person approaches to also incorporate within-person designs that reflect adolescents' lived emotional rhythms.

**The case for experience-specific friendship analyses**

Adolescent friendships are developmentally consequential, serving as both sources of support and contexts of stress (H. L. Schacter et al., 2021). They often provide intimacy, affection, and validation (Chu et al., 2010; Furman & Buhrmester, 1985), but can also involve exclusion, jealousy, and conflict (Azmitia et al., 2005; Öztürk & Sumbas, 2023). Girls who are more emotionally invested in friendships tend to report higher friendship quality overall, but also greater sensitivity to relational disruptions–suggesting that the same orientation that fosters close relationships may also amplify vulnerability when those relationships falter (Laursen, 1995; Rose et al., 2016; Thomas & Daubman, 2001). Much prior research has collapsed diverse features into broad indices of positive or negative friendship quality (Schwartz-Mette et al., 2020a). Research

relying on global assessments of friendship quality indicates that high-quality friendships predict better adjustment outcomes, such as higher self-esteem and lower depressive symptoms (Narr et al., 2019). However, it is less clear whether there are distinct psychological functions of specific positive and negative friendship features.

Friendship features represent mid-level constructs between daily experiences and overall quality, encompassing processes such as disclosure or conflict and provisions such as security or companionship (Bagwell & Bukowski, 2018). Importantly, even correlated friendship features may have distinct implications: perceived security with friends predicts reduced anxiety, whereas intimacy does not (Wood et al., 2017). Negative features also diverge–feeling dominated by friends predicts internalizing symptoms (H. L. Schacter et al., 2024), while jealousy in friendships, common in early adolescence, is linked to loneliness and relational aggression (Lennarz et al., 2017; Parker et al., 2005). Over-aggregation of items across multiple friendship features may therefore oversimplify theory and weaken prediction (Mõttus et al., 2019). Recent work increasingly isolates specific relational processes within friendships rather than examining the effects of overall positive or negative friendship quality. Emotional support from best friends, for example, predicts lower depressive symptoms over time among adolescent girls (Giletta et al., 2017). However, few studies combine this feature-specific approach with daily measurement to capture real-time emotional consequences of specific and time-varying friendship experiences.

**Present study**

Friendships in adolescence are multifaceted and dynamic, yet understanding of if and how close friendship experiences fluctuate within adolescents' daily lives remains limited. Emerging evidence shows that specific friendship features (e.g., support, security, rejection, or jealousy) carry distinct associations with emotional well-being, but some experiences remain

understudied in daily life. Consistent with the literature, we conceive of different relational domains (such as friendships and romantic partnerships) as conceptually distinct contexts of emotional experience rather than reflections of a single, generalized relational tone (Berndt, 2002; Bukowski et al., 2020). Building on developmental theory, we examine a broad range of daily friendship experiences, including perceptions of both positive (supported, secure, trusted, valued, understood) and negative (rejected, lonely, jealous, stressed) experiences.

Using a daily diary design, we investigate how daily fluctuations in friendship experiences relate to daily positive and negative affective states among adolescent girls. Adolescents reported multiple specific emotions, including depressed, anxious, sleepy, stressed, self-confident, happy, joyful, and excited. We hypothesized that positive friendship experiences would predict higher positive affect and lower negative affect, whereas negative experiences would predict greater negative and reduced positive affect. Although we expected heterogeneity across specific emotion-experience links, we did not make narrow predictions given the exploratory nature of the study.

## Method

### Participants

This study draws on data from the Transitions in Adolescent Girls (TAG) project (for protocol, see (Barendse et al., 2020). Participants ($N$ = 174) were recruited in 2015-2017 from Lane County, Oregon, when participants were between 10 and 13 years old. Participants had completed up to six waves of primary data collection at the time this manuscript was prepared, with each wave of data collection spaced roughly 1.5-2.0 years apart. By Wave 4–the first wave of data collection where all participants were asked to complete the daily self-report measures and thus the wave used for the current analyses–only 110 participants remained, and of these, 90

completed the relevant measures. This retention rate is comparable to average longitudinal studies' average retention rate of 73.9% over 5 years (Teague et al., 2018), even accounting for the COVID-19 pandemic. The 64 participants who dropped out between Wave 1 and Wave 4 did not significantly differ from the rest of the sample in terms of gender identity, racial/ethnic identity, socioeconomic factors (like free lunch enrollment and household income), and parental education (as measured at Wave 1). More information about attrition analyses can be found in the *Supplemental File.*

At Wave 4, participants (N = 90) in this subsample were between 14.67 to 18.92 years (*M* = 16.67 years, *SD* = .90 years). Of these participants, although all were assigned female at birth, at the Wave 4 time point, 87.80% identified as female, 8.89% identified as non-binary, and 3.33% identified as male. Additionally, 80.5% were White, 12.6% were Hispanic/Latino/Chicano, 5.7% were Black, 5.7% were Asian, 5.2% were Native American/Alaska Natives, and 3.5% categorized themselves as Other. Additionally, 19.0% categorized themselves as Multiracial. Participants had no history of significant medical or neurological disorders. Written informed assent/consent was obtained from all participants, as well as caregiver consent for participants under age 18.

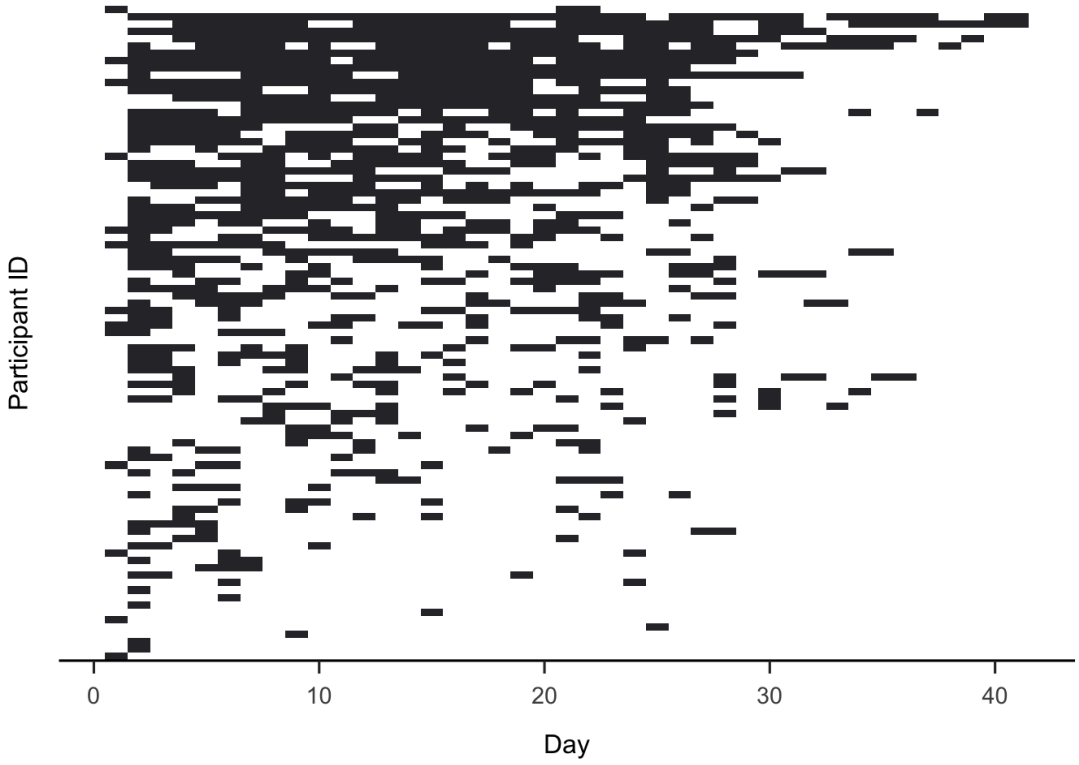
**Data collection**

Each wave consisted of two primary data collection sessions. First, adolescents and their caregivers (re)consented to participate, and then in the initial session completed a semi-structured diagnostic interview and set of questionnaires (Session 1). Next, participants completed at-home questionnaires and *daily diaries*, during which they received a daily text message with a link to a Qualtrics survey. This lasted the entire period between Sessions 1 and 2, when participants returned to the lab for an MRI scan and final set of questionnaires. The

targeted date for Session 2 was 30 days after session 1. The average number of daily diary days was 30.32; however, due to scheduling issues, some participants had as many as 47 days between Sessions 1 and 2. We limited each participant's diary entries to a maximum of 40 days for analysis. Moreover, because survey links were active for 24 hours, some participants completed two daily diary assessments on the same calendar day; in those cases, we chose to retain only their first completed assessment. The average number of daily diary entries provided by each participant was 16.48 (*SD* = 9.41, range = 1-40, resulting in a total of 1,724 observations; see *Figure 1* for a graphical representation of participant participation in this portion of the study). Aside from demographic information, this study only uses data from Session 2, or the daily diary assessments.

**Figure 1.**

*Daily Participation of Each Adolescent in the Study.*



*Note.* Each row is a single participant, and each square in that row represents a single day in the study. Participants are ordered vertically by the total number of days the daily diary was completed from most to least. Black squares represent days in which participants completed at least one question in the daily diaries, and white squares represent days in which participants did not complete the daily diary.

***Measures***

At the beginning of each daily survey, participants were asked to report their (single) closest friend and indicate if this friend had changed from the prior day. To preserve continuity of subject in the face of changing relationships, we only used reports about the person who was named on the first day of the daily dairy. If on a given day a participant chose to respond to the prompts with respect to a different friend, that day's diary assessment was not included in the analysis ($N_{observations}$ = 62 days, 3.60% of the total reports; $N_{participants}$ = 11). Our average of over 16 days per participant, with a total of 1,724 daily observations across 90 participants, constitutes a robust within-person sample size for experience sampling methodology (EMA) designs. This level of data density is within the norms established by the literature for modeling daily variability in experiences and affect in adolescents (Czyz et al., 2018; Mulvaney et al., 2013; Nezlek, 2012)**.**

**Daily perceptions of close friendship experiences.** This variable was measured using daily self-reports. Every day, participants were asked to rate how much they "felt [each item] yesterday in their closest friendship" on a scale from 0 to 100. The nine friendship items were: supported, rejected, lonely, secure, jealous, trusted, valued, stressed, understood. These single-word items were selected to reflect experiences which may underlie global assessments of relationship experiences for adolescents, including the Intimate Friendship Scale (IFS;

Sharabany, 1994), the Network of Relationships Inventory (NRI; Furman & Buhrmester, 2004), and the Self-Report of Aggression and Social Behavior Measure (SRASBM; Morales & Crick, 1998). An example item from the IFS is "It bothers me to have other kids come around and join in when the two of us are doing something together." An example item from the NRI is "How much does this person treat you like you're admired and respected?". Example items from the SRASBM include "I get jealous if one of my friends spends time with his/her other friends even when I am busy" and "I have a friend who excludes me from doing things with her/him and her/his other friends when s/he is mad at me."

**Daily perceptions of romantic experiences.** We also asked participants about their romantic relationship using the same strategy as close friendship daily self-reports. While daily romantic experiences were not the focus of this study, these data allowed us to run supplementary analyses to explore the distinctiveness of close friendship experiences for participants who were also in a romantic relationship. Of the 90 participants who completed the daily diary surveys, only 31 reported being in a romantic relationship (34.4%). This resulted in 622 daily observations for both romantic relationships and close friendships.

**Daily affective states.** This variable was measured using self-reports during the daily diary portion of the study. Participants were asked to rate how much they "felt [each item] yesterday" on a scale from 0 to 100, with higher scores indicating greater intensity of the emotion. The eight daily affective states assessed were: depressed, anxious, sleepy, self-confident, stressed, happy, joyful, and excited.

**Analyses**

To estimate the relationship between daily friendship experiences and daily affective states, we used multilevel modeling to regress daily affective states onto each daily friendship

experience, nesting days within participants. We allowed varying intercepts and varying slopes on the relationship between daily friendship experience and daily affective states. We ran separate models for each combination of 8 daily affective state outcomes and 9 friendship variables, resulting in 72 total models. In each model, we controlled for the previous day's affect (lagged effect), day in the study (1-40) to better isolate the relationship between friendship experiences and change in affect.

For the subset of participants who also reported daily romantic relationship experiences (*N = 31*), we conducted two sets of supplementary analyses. First, all 72 models were re-estimated in this smaller sample with daily romantic relationship experience included as an additional covariate; full results are available in the Supplementary Materials. Second, we re-estimated these models with a friendship × romance interaction term added, to test whether the affective significance of daily friendship quality depended on the concurrent quality of one's romantic relationship.

Primary results are reported from the full sample models; romantic relationship covariates are not included in the main models given the reduction this would cause to sample size. The equations are as follows:

*Main model*

*Level 1*

$$\textit{Daily affect}_{id} = \beta_0 + \beta_1 \textit{Daily friendship}_{id} + \beta_2 \textit{Previous day's affect} + \beta_3 \cdot \textit{Day}_{id} + \epsilon_{id}$$

*Level 2*

$$\beta_{0d} = \beta_0 + \mu_{0d}$$
$$\beta_{1d} = \beta_1 + \mu_{1d}$$
$$\beta_{2d} = \beta_2$$
$$\beta_{3d} = \beta_3$$

*Subset (romantic relationship interaction) model*

*Level 1*

$$\textit{Daily affect}_{id} = \beta_0 + \beta_1 \textit{Daily friendship}_{id} + \beta_2 \textit{Previous day's affect} + \beta_3 \cdot \textit{Day}_{id} + \beta_4 \cdot \textit{Daily romance}_{id} + \beta_5 \cdot (\textit{Daily romance*Daily friendship})_{id} + \epsilon_{id}$$

*Level 2*

$\beta_{0d}=\beta_0 + \mu_{0d}$
$\beta_{1d}=\beta_1 + \mu_{1d}$
$\beta_{2d}= \beta_2$
$\beta_{3d}= \beta_3$
$\beta_{4d}= \beta_4$
$\beta_{5d}= \beta_5$

Even within positive and negative friendship domains, prior work has found that distinct features like security, intimacy, dominance, and jealousy predict different developmental outcomes, underscoring that not all experiences operate through the same mechanisms or have equivalent implications for adolescent adjustment (Parker et al., 2005; H. L. Schacter et al., 2024; Wood et al., 2017). Therefore, we report these analyses for each individual daily item. We applied an FDR (False Discovery Rate) correction for multiple comparisons to control the proportion of false positives. FDR-corrected *p*-values smaller than .05 were considered statistically significant. Intraclass correlations (ICCs) were calculated for all variables using a simple random intercept MLM with no covariates; ICCs were the ratio of between person variance to overall variance. The supplemental file contains the models without lag and without FDR correction, as well as all daily friendship experience variables simultaneously entered as predictors, for readers interested in these results.

## Results

**Table 1.**

*Descriptive Statistics*

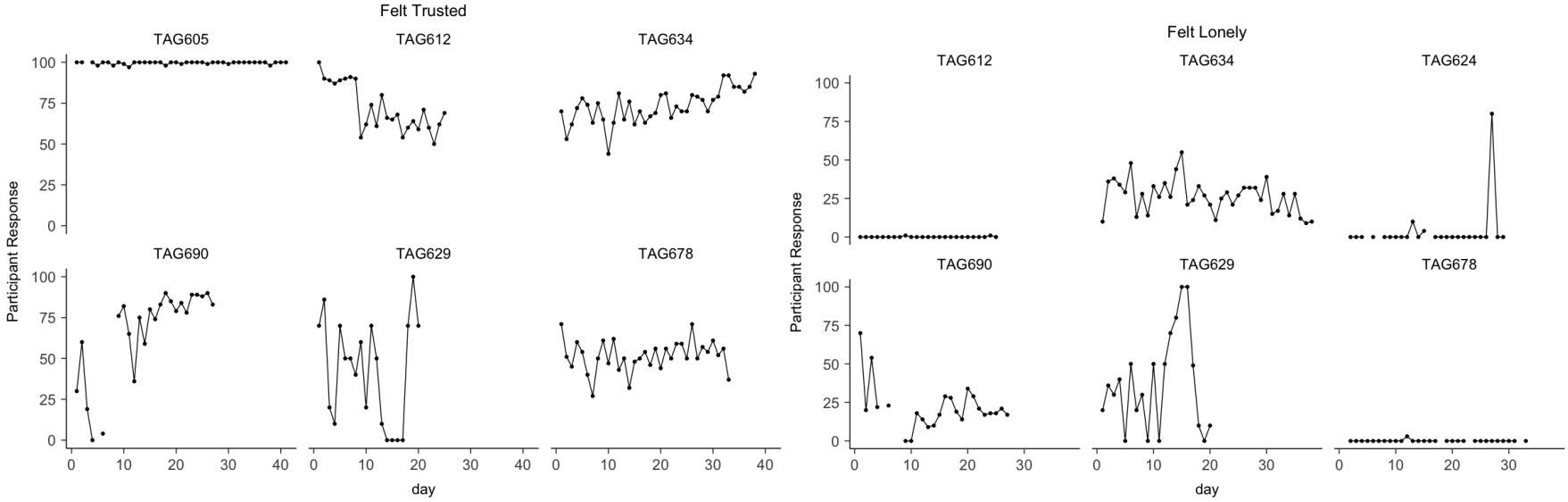
| Variable | Mean | SD | ICC |
|---|---|---|---|
| ***Friendship experiences*** | | | |
| supported | 74.35 | 21.70 | 0.66 |
| rejected | 6.16 | 15.75 | 0.58 |
| lonely | 11.65 | 19.93 | 0.51 |
| secure | 74.94 | 23.24 | 0.67 |
| jealous | 6.95 | 14.12 | 0.41 |

| | | | |
|---|---|---|---|
| trusted | 76.23 | 22.63 | 0.64 |
| valued | 76.20 | 22.91 | 0.65 |
| stressed | 14.53 | 22.48 | 0.55 |
| understood | 72.04 | 24.97 | 0.58 |
| ***Affect*** | | | |
| depressed | 21.10 | 23.83 | 0.62 |
| anxious | 30.96 | 25.59 | 0.53 |
| sleepy | 43.25 | 27.13 | 0.54 |
| self-confident | 46.98 | 27.42 | 0.61 |
| stressed | 37.44 | 26.68 | 0.51 |
| happy | 55.22 | 24.74 | 0.48 |
| joyful | 44.51 | 30.18 | 0.58 |
| excited | 41.92 | 29.34 | 0.43 |

*Note.* Descriptive statistics for daily diary variables, including mean, standard deviation (SD), and intraclass correlation (ICC). These statistics are based on the completely pooled set of all daily diary responses.

**Figure 2.**

*Examples of Daily Responses*




*Note.* Examples of daily responses to the question "How trusted did you feel in your friendship in the past day?", and "How lonely did you feel in your friendship in the past day?" Day in the daily diary is represented on the *x*-axis, while the participant's response to the question each day is represented on the *y*-axis. This set of participants was chosen to illustrate different patterns of daily response. For example, participant 605 has a high mean and low variability for feeling trusted, while participant 629 has a low mean and high variability for "felt lonely."

In terms of daily friendship experiences, on average the participants experienced high levels of feeling supported, feeling secure, feeling trusted, feeling valued, and feeling understood in their single closest friendship across the daily diary period. They also experienced low levels of feeling rejected, feeling lonely, feeling jealous, and feeling stressed in their single closest friendship (see Table 1). There was variability in participant responses to all nine daily friendship experiences (see Table 1 and Figure 2).

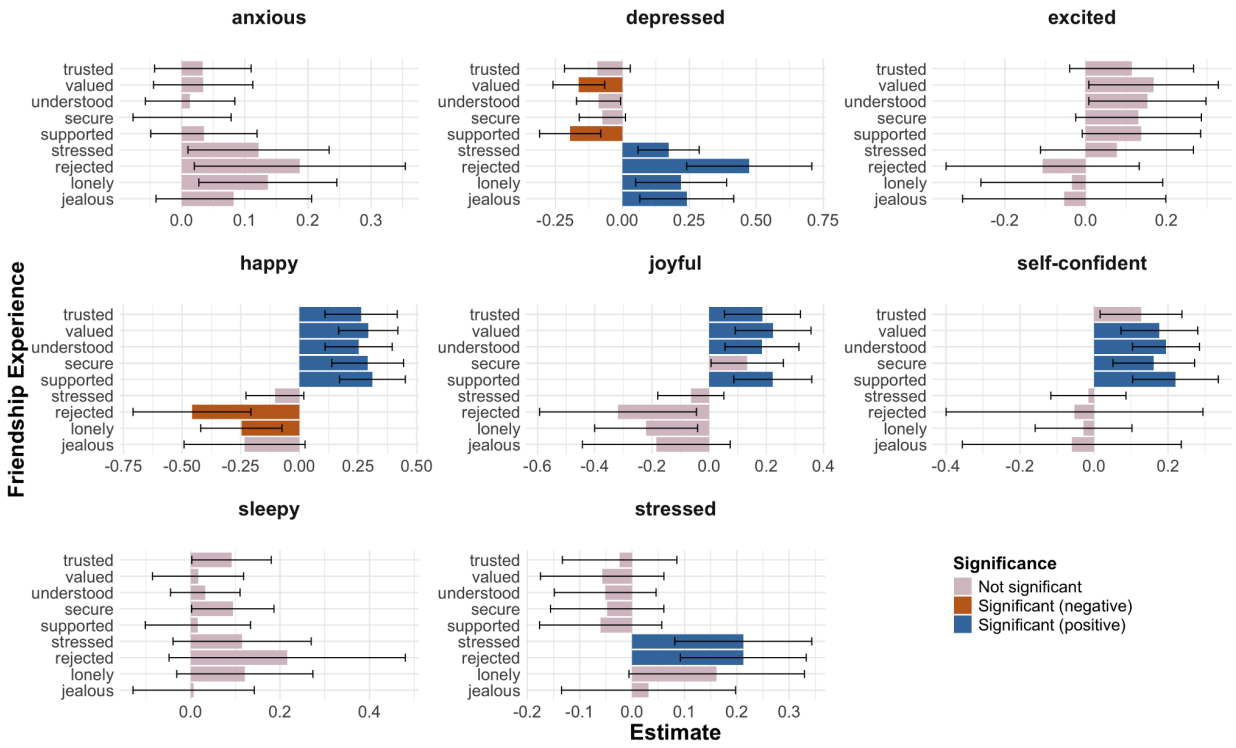
In terms of daily affective states, on average the participants experienced moderate levels of feeling anxious, sleepy, self-confident, stressed, happy, joyful, and excited across the daily diary period. Participants experienced slightly lower levels of feeling depressed compared to the other affective states.

**How do daily perceived friendship experiences relate to daily perceived affect?**

We regressed each daily affect item onto each daily friendship experience item, controlling for the previous day's affect. Each model used one daily friendship item to predict one daily affect outcome. This was repeated for all daily friendship items and all daily affect outcomes. Models predicting daily depressed affect control for daily depressed affect reported on the previous day, models predicting happiness control for happiness reported on the previous day, and so on. The regression coefficients for the associations between daily affect and friendship experiences are presented in Table 2. In this summary, we present both the *p*-value and the FDR-corrected *p*-value, but our interpretation below is based on only the FDR-corrected *p*-value.

**Figure 3.**

*Associations between daily friendship experiences and daily affective states*




*Note.* Associations between daily friendship experiences and  of daily affective states, controlling for previous day's daily affect symptoms (daily affect symptoms score ~ daily friendship experiences score + daily affect symptoms yesterday score), as well as day in the study.. Each bar in the plot represents the regression coefficient from a separate model (9 friendship predictors x 8 affect outcomes, or 72 models). The direction and color of the estimate indicates whether that friend quality predicts a relative improvement or decline in affect from one day to the next. A positive estimate means that stronger experiences of a friendship quality are associated with higher levels of the affect variable in question, beyond what would be expected based on yesterday's affect. Significance is based on FDR-corrected p-values.

**Table 2.**

*Daily affective state and daily friendship quality*

| Daily Affective State | Daily Friendship Experience | estimate | p.value | p.adjusted |
|---|---|---|---|---|
| **anxious** | | | | |
| | lonely | 0.14 [0.03, 0.25] | .017 | .051 |
| | rejected | 0.19 [0.02, 0.35] | .034 | .086 |
| | stressed | 0.12 [0.01, 0.23] | .036 | .086 |
| **depressed** | | | | |
| | jealous | 0.24 [0.07, 0.42] | .012 | **.040** |
| | lonely | 0.22 [0.05, 0.39] | .013 | **.041** |
| | rejected | 0.47 [0.24, 0.71] | < .001 | **.006** |
| | stressed | 0.17 [0.06, 0.29] | .005 | **.020** |
| | supported | -0.19 [-0.31, -0.08] | .001 | **.009** |
| | understood | -0.09 [-0.17, -0.01] | .034 | .086 |
| | valued | -0.16 [-0.26, -0.07] | < .001 | **.009** |
| **excited** | | | | |
| | understood | 0.15 [0.01, 0.30] | .040 | .089 |
| | valued | 0.17 [0.01, 0.33] | .041 | .089 |
| **happy** | | | | |
| | lonely | -0.25 [-0.42, -0.07] | .010 | **.034** |
| | rejected | -0.46 [-0.71, -0.21] | .003 | **.011** |
| | secure | 0.29 [0.14, 0.44] | < .001 | **.006** |
| | supported | 0.31 [0.17, 0.45] | < .001 | **.003** |
| | trusted | 0.26 [0.11, 0.42] | .002 | **.009** |
| | understood | 0.25 [0.11, 0.40] | .001 | **.009** |
| | valued | 0.29 [0.17, 0.42] | < .001 | **.002** |
| **joyful** | | | | |
| | lonely | -0.22 [-0.40, -0.04] | .021 | .061 |
| | rejected | -0.32 [-0.59, -0.04] | .029 | .078 |
| | secure | 0.13 [0.01, 0.26] | .040 | .089 |
| | supported | 0.22 [0.09, 0.36] | .003 | **.011** |
| | trusted | 0.19 [0.05, 0.32] | .008 | **.029** |
| | understood | 0.18 [0.06, 0.31] | .008 | **.029** |
| | valued | 0.22 [0.09, 0.36] | .002 | **.009** |
| **self-confident** | | | | |
| | secure | 0.16 [0.05, 0.27] | .005 | **.022** |
| | supported | 0.22 [0.10, 0.34] | <.001 | **.006** |
| | trusted | 0.13 [0.02, 0.24] | .026 | .073 |
| | understood | 0.19 [0.10, 0.29] | <.001 | **.003** |
| | valued | 0.18 [0.07, 0.28] | .002 | **.009** |
| **sleepy** | | | | |

| | | | | |
|---|---|---|---|---|
| | secure | 0.09 [0.00, 0.19] | .045 | **.**093 |
| | trusted | 0.09 [0.00, 0.18] | .044 | .092 |
| **stressed** | | | | |
| | rejected | 0.21 [0.09, 0.33] | .002 | **.009** |
| | stressed | 0.21 [0.08, 0.34] | .002 | **.010** |

*Note:* Associations reflect within-person links between daily friendship experiences with participants' single closest friend and same-day mental health outcomes, controlling for the previous day's mental health. Results are shown only for friendship experiences that were significant at the uncorrected level. False discovery rate (FDR) correction was applied to adjust for multiple comparisons; adjusted p values are reported.

As shown in Table 2 and Figure 3, on days that adolescents reported feeling more supported and valued than usual (i.e., higher than their average perceived support and feeling valued across the whole diary period) by their best friend (but not understood, secure, or trusted), they reported significantly lower levels of daily depressed affect. On days adolescents felt more lonely, rejected, jealous, or stressed than usual, they reported significantly higher daily depressed affect. On days adolescents felt more secure, supported, trusted, understood, or valued than usual, they reported significantly higher levels of happiness. On days adolescents felt more lonely or rejected than usual (but not more jealous or stressed), they reported significantly lower levels of happiness. On days adolescents felt more supported, trusted, valued, or understood than usual (but not more secure), they reported significantly higher levels of joy. On days adolescents felt more secure, supported, understood, or valued than usual (but not more trusted), they reported significantly higher levels of self-confidence. Finally, on days adolescents felt more rejected or stressed than usual (but not more lonely or jealous), they reported significantly higher levels of stress.

As an additional check, we also examined whether these within-person associations held

when accounting for concurrent romantic relationship experiences. To probe whether associations between daily friendship experiences and daily affective states were specific to friendship or might reflect a more general close-relationship effect, we conducted supplementary analyses in the subset of participants who also reported on their daily romantic relationship experiences ($N = 31$). We estimated models including daily friendship experience, daily romantic relationship experience, and their interaction as predictors of each daily affective state, controlling for the previous day's affect. Full model comparisons are available in the Supplementary Materials. Importantly, the reduced sample size ($N = 31$) limits statistical power, and adolescents currently in romantic relationships may differ meaningfully from the broader sample; accordingly, all patterns from these supplementary analyses should be interpreted with caution. In the subset models, friendship effects that were significant in the primary analyses were largely attenuated and non-significant, while daily romantic relationship experiences showed relatively robust independent associations with daily affect. A small number of friendship × romance interaction terms were statistically significant (see Table 3), suggesting that for some outcomes, the two relationship contexts did moderate one another's associations with affect, rather than operating as fully independent systems.

**Table 3.**

*Interaction effects and simple slopes predicting daily affect.*

| | | Interaction | | | Friendship effect (at mean romance) | | | Romance effect (at mean friendship) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Daily Affect** | **Daily Friendship Variable** | **Interaction** *b* | **SE** | ***p*** | **Friendship** *b* | **SE** | ***p*** | **Romance** *b* | **SE** | ***p*** |
| **excited** | secure | 0.016 | 0.007 | * | 0.128 | 0.145 | | 0.470 | 0.216 | * |
| | trusted | 0.011 | 0.007 | | 0.100 | 0.159 | | 0.450 | 0.226 | * |
| | supported | 0.013 | 0.007 | | -0.082 | 0.145 | | 0.635 | 0.221 | ** |
| | valued | 0.007 | 0.007 | | 0.052 | 0.142 | | 0.438 | 0.215 | * |
| **sleepy** | secure | -0.010 | 0.005 | * | 0.027 | 0.128 | | 0.175 | 0.147 | |
| | rejected | 0.034 | 0.010 | * | 0.102 | 0.258 | | 0.338 | 0.23 | |
| **depressed** | jealous | 0.004 | 0.011 | | 0.168 | 0.208 | | -0.340 | 0.152 | * |
| | stressed | -0.005 | 0.005 | | 0.261 | 0.090 | * | -0.140 | 0.135 | |
| | supported | 0.009 | 0.004 | * | -0.092 | 0.088 | | -0.106 | 0.125 | |
| **joyful** | secure | 0.008 | 0.006 | | 0.023 | 0.128 | | 0.608 | 0.184 | ** |
| | rejected | -0.022 | 0.007 | ** | -0.113 | 0.154 | | 0.500 | 0.402 | |
| | lonely | -0.011 | 0.011 | | 0.174 | 0.266 | | 0.512 | 0.209 | * |
| | jealous | -0.014 | 0.019 | | 0.480 | 0.514 | | 0.703 | 0.226 | ** |
| | stressed | -0.013 | 0.006 | | -0.106 | 0.108 | | 0.514 | 0.235 | * |
| | supported | 0.010 | 0.006 | | -0.021 | 0.130 | | 0.703 | 0.189 | *** |
| | trusted | 0.010 | 0.007 | | 0.179 | 0.141 | | 0.503 | 0.183 | ** |
| | understood | 0.004 | 0.005 | | 0.020 | 0.123 | | 0.592 | 0.185 | ** |
| | valued | 0.005 | 0.006 | | 0.037 | 0.107 | | 0.565 | 0.175 | ** |
| **self-confident** | trusted | 0.000 | 0.004 | | 0.098 | 0.106 | | 0.246 | 0.124 | * |
| | supported | 0.000 | 0.004 | | 0.215 | 0.117 | | 0.234 | 0.117 | * |
| | stressed | 0.003 | 0.005 | | -0.040 | 0.088 | | 0.362 | 0.157 | * |
| | secure | -0.001 | 0.004 | | 0.008 | 0.124 | | 0.275 | 0.128 | * |

| | | | | | | |
|---|---|---|---|---|---|---|
| lonely | 0.007 | 0.006 | -0.044 | 0.123 | 0.484 | 0.160 ** |

*Note.* b = unstandardized estimate. "Friendship effect (at mean romance)" reflects the conditional effect of daily friendship experience on daily affect when daily romantic experience is held at its mean. "Romance effect (at mean friendship)" reflects the conditional effect of daily romantic experience when daily friendship experience is held at its mean. Significance codes: $p < .001$~ ***, $p < .01$ ~ **, $p < .05$ ~ *

# Discussion

Friendships are critical to adolescent psychosocial development, especially for girls, whose friendships tend to be more emotionally intimate and central to their sense of self, compared to male adolescents (Rose & Rudolph, 2006). This study contributes to a growing literature that examines how daily fluctuations in friendship experiences shape adolescents' emotional lives, with a specific focus on adolescent girls. By capturing real-time reports of both friendship dynamics and emotional states, we offer a nuanced understanding of how individual features of friendships, such as support, rejection, and security, relate to affect on a day-to-day basis. Crucially, this study addresses a key gap in the literature: whereas prior work has often relied on global or retrospective reports of friendship quality and their effects on distal adjustment outcomes months or years later, relatively less is known about how specific friendship experiences operate and change within adolescents in daily life. Further, by using a daily diary design, we provide fine-grained, within-person evidence of how distinct friendship experiences correspond with fluctuations in affect, extending prior research that has typically focused on broader positive and negative friendship dimensions. That is particularly meaningful given that, for adolescents not yet in romantic relationships, friendship represents the primary peer relational context in which emotional life is organized on a daily basis. The current approach helps illuminate the particular friendship moments that may be most highly associated with adolescents' emotional well-being.

## Key findings and interpretations

Results revealed that adolescent girls' daily friendship experiences were tied to same-day affect, with supportive and challenging interactions showing distinct emotional correlates. Before unpacking key associations between friendship dynamics and affect, it is important to consider

the descriptive context in which these experiences occurred. On average, girls reported overwhelmingly positive daily friendship experiences. Feelings of being supported, valued, secure, trusted, and understood were reported at notably high levels (approximately 70 out of 100), while negative experiences such as rejection, jealousy, and loneliness were rarer (means < 12 out of 100). This pattern is encouraging, painting a hopeful picture of adolescent peer life in which affirming and emotionally validating interactions are more common than distressing or conflictual ones.

Despite their infrequency, the few negative experiences that were reported showed significant associations with daily emotional adjustment. Feeling more rejected, lonely, or excluded than usual in the context of one's closest friendship was linked with elevated daily levels of stress and depressed affect, and with diminished happy, joyful, self-confident, or excited affect. This suggests that even relatively rare negative relational moments can have substantive emotional consequences, especially in a developmental period marked by heightened sensitivity to peer feedback. These findings are consistent with prior research showing that negative peer experiences tend to exert stronger effects on adolescents' emotional functioning than positive ones (Schwartz-Mette et al., 2020a) and suggest that occasional ruptures in close friendships can reverberate widely across daily affect.

With respect to positive daily friendship experiences, results indicated that feeling supported, understood, and valued were associated with increases in daily feelings of joy, happiness, and self-confidence. These findings align with theory and empirical work emphasizing the self-affirming and emotionally sustaining power of close friendships (Berndt, 2002; Giletta et al., 2017; H. L. Schacter & Juvonen, 2019; Sullivan, 1953). Importantly, while positive close friendship experiences were strongly linked with elevated joy, happiness, and

self-confidence, they were less consistently associated with reductions in depressed affect, anxiety, or stress. For instance, feeling supported and valued predicted daily depressed affect, but other positive experiences, such as feeling secure, understood, or trusted, did not show similar associations. Notably, a supplementary analysis suggested that these friendship effects may not be entirely independent of concurrent romantic relationship quality; however, given the power limitations of that subsample, the degree to which the observed associations are friendship-specific remains an open question. One possible explanation is that not all positive experiences operate equally across affective domains. Feeling supported and valued may buffer against negative self-appraisals (Thoits, 2013) or distress (Cohen & Wills, 1985) directly tied to interpersonal evaluation, thereby lowering daily depressed affect. In contrast, feeling secure or trusted may reflect more generalized relational stability (Mikulincer & Shaver, 2019), which may enhance well-being without offering the same immediate emotional relief during moments of distress. Similarly, being understood may promote connectedness and positive mood (Morelli et al., 2014) but may not be sufficient to alleviate more internalized forms of negative daily affective states like daily depressed affect.

While feeling supported, valued, and secure were associated with beneficial daily affective state outcomes, these associations were often experience- and affect-specific. Conversely, some negative experiences, including feeling rejected or lonely, showed broader and more consistent associations with daily affective states than positive experiences did. Specifically, rejection and loneliness were significantly associated with elevated depressed affect and stress, and with diminished happiness and joy–spanning both negative and positive affect outcomes. In contrast, most positive friendship experiences were significantly linked to only a subset of affective outcomes, primarily happiness, joy, and self-confidence, without showing

equivalent associations with reductions in negative affect. This pattern is consistent with research showing that harmful friendship dynamics tend to show stronger ties to emotional adjustment difficulties than supportive features show to emotional benefits (Schwartz-Mette et al., 2020a), though we note that the present study was not designed to directly test asymmetry between positive and negative experiences and caution against overinterpreting this pattern. Not all negative experiences demonstrated significant links with daily affective states in our data, and some affective outcomes, like daily anxiety, were not reliably predicted by either positive or negative features, contrasting with prior work that found anxiety-buffering effects of friendship support (La Greca & Harrison, 2005).

Interestingly, only positive daily friendship experiences–particularly feeling supported, valued, understood, and secure–were significantly related to daily self-confidence, whereas negative daily friendship experiences were not. This pattern suggests that affirming friendship moments may play a more central role in shaping adolescents' daily self-evaluations than occasional relational ruptures play in undermining them. Given that girls' friendships are often characterized by heightened emotional investment, relational interdependence, and sensitivity to interpersonal feedback (Rose & Rudolph, 2006), these findings highlight how daily experiences of validation may be especially salient for reinforcing girls' momentary sense of self-worth and competence. In contrast, negative experiences such as rejection, jealousy, or loneliness may primarily influence daily affective distress (e.g., sadness or stress) without directly eroding self-confidence at the daily level. These distinctions underscore the value of examining specific friendship experiences rather than broad composites of "positive" or "negative" friendship quality, as different features appear to carry distinct affective and self-evaluative consequences.

**Within-person variability and distinctiveness of friendship experiences**

Beyond the primary associations between specific friendship experiences and affect, the ICC patterns and the supplementary romantic relationship analyses together highlight some additional aspects of the structure of adolescent relational lives. The ICC patterns address the degree to which daily friendship experiences reflect genuine within-person fluctuation versus stable individual differences. Meanwhile, the supplementary romantic relationship analyses explorewhether the emotional significance of friendship is specific to that relational context or reflects a more general sensitivity to close relationships, as well as suggest that daily affective states are not simply generalizing to perceptions of close relationship experiences.

The intraclass correlations (ICCs) observed across the daily friendship items also offer valuable insight into the nature of adolescents' social experiences. Across all friendship experiences, at least a third of the variance was attributable to within-person fluctuations rather than stable between-person differences. This reinforces the view that adolescents' perceptions of their friendships are dynamic, varying from day to day. Notably, some friendship experiences, such as feeling jealous or lonely, demonstrated particularly high within-person variability, suggesting that these feelings may be especially sensitive to daily interpersonal events. In contrast, experiences like feeling secure, trusted, or valued showed more stability, with higher ICCs, indicating that they may reflect more enduring relational patterns or trait-like perceptions. The relatively high stability of perceived security, in particular, may reflect the protective role of consistent, supportive relationships during adolescence. This interpretation complements recent findings showing that adolescents who reported greater continuity in the close friends they identified over a two-week period also experienced more positive mood states (Ehrhardt et al., 2025). These findings further validate our use of a daily diary design and underscore the

importance of attending to both stable and shifting aspects of adolescents' social worlds in understanding their emotional adjustment.

Additionally, although friendships and romantic relationships are both central during adolescence, the present findings raise questions about how these two relational contexts jointly shape daily affect. In a supplementary analysis among the subset of participants who reported being in a romantic relationship (*N = 31*), friendship effects were largely attenuated and non-significant when romantic experiences were included as a covariate, while romantic relationship experiences showed relatively robust independent associations with daily affect, particularly for joyful and self-confident outcomes. The small number of significant interaction terms suggests that for some outcomes, the two relationship contexts did moderate one another's associations. Importantly, however, this attenuation of friendship effects was observed exclusively among partnered adolescents and cannot be generalized to the broader sample. For the many adolescent girls who are not in romantic relationships at any given time–given the considerable variability in when romantic relationships are first entered–friendship remains the primary peer relational context. Moreover, even among partnered adolescents, romantic relationships at this age tend to be shorter-lived and more volatile than friendships (Connolly & McIsaac, 2011), suggesting that friendship may account for more cumulative affective experience across adolescence by virtue of its greater continuity, even if it is temporarily overshadowed on days when romantic experiences are salient. Additionally, if daily affective states were simply driving biased perception uniformly across close relationships, friendship and romantic experiences should correlate with affect in parallel ways with no meaningful differences between them. Instead, the two relational contexts showed divergent patterns of association with affect, and among partnered adolescents, romantic relationship experiences

attenuated friendship effects rather than the two operating symmetrically. A uniform perceptual bias stemming from affect would be unlikely to produce this differential dominance of one relationship type over another, nor to generate the observed interaction structure. These patterns therefore point to something contextually specific about each relationship type that carries its own emotional weight. Whether friendships and romantic relationships operate as truly independent systems, or whether romantic relationships grow increasingly dominant in their affective significance across-mid-to late adolescence, remains an important question for future work with larger, more representative samples.

**Theoretical and practical implications**

Girls' peer relationships are often marked by heightened emotional investment, relational interdependence, and sensitivity to interpersonal stressors (Rose & Rudolph, 2006), making them uniquely vulnerable to both the protective and detrimental effects of daily friendship dynamics. Our findings highlight how this sensitivity cuts both ways. Feeling supported, valued, and understood reliably elevated positive emotions such as joy and self-confidence, whereas even relatively infrequent negative experiences, such as rejection or exclusion, were associated with heightened negative affect, including depressed mood and stress. These patterns underscore how daily emotional well-being is shaped by moment-to-moment shifts in girls' friendship experiences, particularly whether they feel seen, accepted, or disconnected.

By focusing on discrete daily friendship experiences (e.g., feeling supported, rejected, or secure) rather than global indices of friendship quality, this study advances theoretical precision in understanding adolescent peer dynamics as they unfold in daily life. Our findings suggest that not all relational experiences carry equal emotional weight. From both conceptual and applied perspectives, experiences that signal validation of the self, feeling valued, supported, and

understood, emerged as especially potent for promoting positive affect, whereas experiences reflecting rejection and loneliness were particularly consequential for daily depressed affect and stress.

Developmentally, these patterns align with longstanding theories emphasizing the central role of validation during adolescence, a period characterized by heightened needs for social approval, self-definition, and interpersonal affirmation (Bagwell & Bukowski, 2018; Sullivan, 1953). Peer relationships contribute to development not simply through companionship, but by providing experiences that confirm, or threaten, the value of the self. The present findings offer empirical support for this mechanism at the daily level: friendship experiences most strongly tied to emotional well-being were those that reflected self-validation. In this way, daily moments of feeling supported or valued may function as micro-affirmations that help regulate adolescents' affective states and, over time, scaffold psychosocial development.

Practically, these findings have implications for educators, clinicians, and caregivers seeking to support adolescent girls' emotional health. Interventions and theories of friendship should prioritize specific relational experiences, particularly support and value, in addition to broad notions of friendship quality. Moreover, increased attention to subtle signs of rejection or loneliness, even within close friendships, may help adults better identify adolescents at risk for emotional dysregulation and intervene in ways that buffer daily affective distress.

**Limitations and future directions**

Several limitations of the current study point to important directions for future research. First, we focused on participants' single closest friendship. This approach has clear strengths, as best friendships are theoretically central during adolescence and allow for tracking change within a specific relationship over time (Berndt, 1996; Urberg et al., 1997). However, it excludes the

broader peer context, including the influence of other friends, group dynamics, and social hierarchies. In addition, we lacked a detailed measure of friendship length beyond whether participants selected the same close friend across waves, and friendships likely varied in duration. Friendship length may shape both the salience of specific subdomains (e.g., support, communication, conflict). Second, although the study captured daily friendship experiences and affect, we did not consider mental health diagnoses. Prior work suggests that depression can shape adolescents' interpretations of social experiences, increasing sensitivity to rejection and self-doubt within friendships (Bhar et al., 2008; Platt et al., 2013). Future research should consider whether a history of depression or concurrent symptoms moderate perceptions of daily friendship experiences and their associations with affect.

Third, while a strength of the study was its focus on multiple developmentally relevant daily friendship experiences, our measurement was necessarily limited. Daily diary designs require balancing breadth with participant burden, and additional experiences relevant to adolescent girls' well-being were not assessed. For example, we did not include daily co-rumination, which is common in close friendships and linked to heightened internalizing symptoms despite co-occurring with support and intimacy (Rose, 2002; Stone et al., 2011). Other experiences such as competition, social comparison, and shared excitement may also be important for capturing the full complexity of adolescents' relational lives.

The present findings also raise questions about how friendship and romantic relationship experiences jointly shape adolescents' daily emotional lives. Although we were able to conduct exploratory analyses in a subset of participants with romantic relationships (N = 31), a fully powered investigation would require a larger sample reporting daily on both relationship contexts simultaneously. Such designs could examine, for instance, whether positive experiences

in one relationship can buffer against strain in the other, or whether emotional costs compound when both are difficult on the same day. Given that romantic relationships grow increasingly central across mid-to-late adolescence, disentangling their contributions from those of friendship represents an important direction for future work.

Finally, interpreting daily reports of "feeling secure" in friendships presents conceptual challenges. Traditional definitions of friendship security emphasize a future-oriented sense of relationship stability and dependability (Blatz, 1966; Furman & Buhrmester, 1985, 2011; Weiss, 1998). In daily reports, however, adolescents may instead be indicating a momentary, self-referential experience–such as feeling confident, accepted, or free from vulnerability within the relationship (Hershenberg et al., 2011; Shomaker & Furman, 2009). This distinction suggests that daily feelings of security may reflect internal states rather than enduring relationship-level qualities. Given adolescents' heightened sensitivity to social evaluation and fluctuating self-concept (Blakemore & Mills, 2014), greater conceptual clarity and measurement precision are needed when assessing friendship security in real-time contexts.

**Conclusion**

This study provides a nuanced account of how close friendships shape emotional well-being among adolescent girls by focusing on discrete, daily experiences such as feeling supported, rejected, or secure. Even subtle day-to-day fluctuations in these friendship experiences were associated with adolescents' daily affect, particularly happiness, self-confidence, and stress, with negative experiences exerting broader emotional effects despite being less frequent. The asymmetry between positive friendship experiences–which were primarily associated with elevated positive daily affect–and negative friendship experiences–which were associated with both heightened negative affect and diminished positive

affect–highlights the importance of attending to micro-level ruptures and affirmations within close friendships as potential targets for prevention. By demonstrating that the specific content of daily interactions matters for adolescents' emotional lives, these findings reinforce developmental theories emphasizing the central role of close friendships in self-validation and affective well-being. More broadly, this work advances developmental theory by underscoring the value of temporally sensitive, within-person approaches for understanding the real-time dynamics of adolescent friendships and emotional resilience.

# CHAPTER 3 - STUDY 2

# DO PARENTS AND CHILDREN AGREE?: A LONGITUDINAL STUDY OF DISCREPANCIES IN PERCEPTIONS OVER TIME

Amala Someshwar, Emorie Beck, Sara Weston, Rick Robins

## Introduction

Adolescence is a transformative period characterized by rapid and multifaceted growth–physically, cognitively, and emotionally. During this phase, relationships with parents undergo significant changes as adolescents seek greater autonomy and self-identity. Because parent-child relationships remain central to adolescent adjustment, these changes can shape outcomes ranging from emotional well-being to social competence and academic functioning (Choudhury et al., 2012; Havelock et al., 2004; Pfeifer & Allen, 2021). Understanding how families navigate evolving roles, communication, and autonomy demands is therefore essential for clarifying the processes that support healthy development (Smetana & Rote, 2019). A core question within these dynamics is whether parents and adolescents perceive parenting behaviors similarly, and what it means when they do not.

Parent-child agreement on behaviors, expectations, and relationship quality is pivotal for fostering positive family dynamics. When parents and adolescents share similar perspectives on family behaviors and norms, they experience healthier relationships, marked by effective communication and a sense of mutual respect (Wickrama & Bryant, 2003). In contrast, discrepancies between parent and adolescent reports may reflect misunderstandings, conflict, or strained communication that increase risk for adolescent emotional and behavioral difficulties (Fan et al., 2023; Hidalgo et al., 2023; Kapetanovic & Boson, 2022; Mastrotheodoros et al., 2020). Conversely, disagreement is not necessarily maladaptive. Adolescents' growing autonomy

may lead them to interpret parenting more critically or as intrusive, even when parents intend support (Kakihara & Tilton-Weaver, 2009). Thus, it is unclear whether discrepancies reflect normative developmental change or meaningful relational strain.

Developmental theory suggests that adolescence may be a particularly salient period for perceptual divergence. As cognitive and socioemotional capacities expand, adolescents develop more complex self- and other-representations (Harter, 2012a; Selman, 1980; Smetana & Rote, 2019). These developments in social-cognitive and relational understanding may contribute to declining agreement with age, yet evidence for developmental changes in parent-child alignment remains mixed (Rajmil et al., 2013; Safford et al., 2005). Some studies, largely focused on mental health and well-being, find that parent–child agreement increases across adolescence, suggesting greater mutual understanding with age, whereas others report persistently low or declining agreement, consistent with growing autonomy and divergence in perspectives (J. D. Jones et al., 2019; Rajmil et al., 2013; Safford et al., 2005; Sourander et al., 1999). In addition, gendered socialization shapes the interpretation of parenting behaviors. Girls are socialized to value emotional closeness and mutual understanding, whereas boys are socialized toward autonomy and instrumental support (Barbee et al., 1993; Rose & Rudolph, 2006). As a result, gendered socialization may lead adolescents to assign different meanings to the same parenting behaviors, increasing the likelihood that parents and adolescents diverge in their perceptions of those behaviors and their relational significance.

Cultural context is also essential for interpreting parent–adolescent agreement. Mexican-origin families in the United States represent a large and growing population–approximately one in four US children are Latine (McLay et al., 2023)–yet remain underrepresented in developmental research. Parenting in Mexican-origin families is often

shaped by values such as familismo (strong commitment to family), respeto (respect for elders and authority), and educación (a moral and social upbringing that extends beyond academics) (Calzada et al., 2010; Halgunseth et al., 2006). Within this context, warmth may be expressed through sacrifice or structure rather than overt emotional display, and firm discipline or monitoring may be interpreted as protection and investment rather than hostility. Mexican immigrant parents may also emphasize monitoring and respect-based discipline as part of preparing children to navigate both heritage and mainstream cultural contexts (Halgunseth & Ispa, 2012; Kim et al., 2019). These norms highlighted the need to study agreement and discrepancy without assuming parent constructs function identically across cultural groups.

A key methodological challenge is the lack of objective reality of parenting behavior. Parent self-reports, adolescent reports, and spouse-reports each reflect distinct vantage points and potential biases (Cook & Goldstein, 1993). Observational ratings by trained coders are often assumed to be objective because coders are not personally involved and may detect subtle interaction patterns. However, the extent to which observers align with family members, and whether such alignment reflects healthier relationship functioning, remains unclear. Additionally few studies distinguish between parents' self-reports and spouse-reports when examining agreement, despite evidence that people may evaluate their own behavior differently than their partner's (Bögels & Melick, 2004; Smith & Williams, 2015).

The present study addresses these gaps by examining parent-child agreement across multiple parenting domains–including warmth, hostility, and relationship quality–using reports from adolescents, mothers, fathers, and trained observers. Using longitudinal data spanning middle childhood (age 10) into adolescence (age 16), we assess parent-child agreement in perception of parenting behavior and behavior change. . We examine whether agreement differs

by adolescent and parent gender, comparing gender-matched and mixed-gender dyads. Finally, by incorporating parent self-reports, spouse-reports, and observer ratings, we evaluate how agreement varies across informants and whether certain parenting constructs show greater perceptual convergence than others.

Our aims are threefold: 1) estimate parent-child agreement across parenting behaviors and test whether agreement varies by construct, rater type, gender, and age; 2) evaluate whether parents and adolescents agree about developmental changes in parenting over time; and 3) examine alignment between observers and family members across parents, adolescents, and parenting domains. By integrating multi-informant, multi-method, and longitudinal data within a Mexican-origin sample, this study aims to clarify how perceptual alignment and discrepancy reflect family dynamics during adolescence.

## Methods

### Data collection and participants

Data came from the California Families Project (Robins et al., 2010), an ongoing longitudinal study of 674 Mexican-origin youth (50% female) and their parents. The project was launched in 2006, when the children were 10 years old. Participants were randomly selected from student rosters provided by school districts in Sacramento and Woodland, California. Eligibility criteria required that the focal child be in the 5th grade, of Mexican origin, and residing with their biological mother. Among eligible families, 72.6% consented to participate. The study received approval from the University of California, Davis Institutional Review Board (Protocol #217484-21). Trained staff conducted interviews with the families in their homes, using either Spanish or English based on the participant's language preference.

During Wave 1, participants ($N_{children}$ = 674, 49.85% female) were between 9.78 and 12.71 years-old ($M$ = 10.78 years, $SD$ = 0.50 years). At Wave 7, participants were 15.72 to 18.38 years old ($M$ = 16.80 years, $SD$ = 0.50 years). See table above for complete demographics (Table 1).

**Table 1.**

*Demographic Information*

| Demographic | Value |
|---|---|
| Child gender (female) | 49.85% |
| Child gender (male) | 50.15% |
| Born in the US | 71.36% |
| Generational status | |
| 1st generation (Born in Mexico) | 28.19% |
| 2nd generation American | 62.31% |
| 3rd generation American | 8.90% |
| Child age (Wave 1) | 10.87 (0.50) |
| Child age (Wave 7) | 16.80 (0.51) |
| Mother age (Wave 1) | 37.29 (5.91) |
| Mother age (Wave 1) | 43.33 (6.21) |
| Father age (Wave 1) | 39.89 (6.05) |
| Father age (Wave 7) | 45.48 (6.57) |
| Household income | $36k (SD = $20k range = $5k-$95k) |
| Household size | 5.54 people (SD = 1.68) |

**Measures**

All participants in the study (children and parents) reported on parenting using a series of measures assessing either interpersonal interactions or parenting behavior, including measures of conflict and relationship quality. These scales are described in detail below. All items were rated on a scale from 1 = never to 4 = always. Unless otherwise stated, children completed each survey twice, once about each parent, and each parent completed the survey twice, once about themselves and once about their co-parent.

All scales were administered when participants were ages 10, 12, 14, and 16 (corresponding to Waves 1, 3, 5, and 7). Ratings were grouped into four main constructs: warmth, hostility, monitoring, and relationship quality.

***Parental Warmth***

Parental warmth was assessed using 9-items from the Iowa Parenting Scale (Conger & Conger, 2002). Sample items included "[How often do you] talk to him [dad] about things that bother you?" and "When you have done something he [dad] likes or approves of, how often does he let you know he is pleased about it?"

Children and parents also completed the 9-item warmth subscale of the Behavioral Affect Rating Scale (BARS; Conger, 1989). Parents only reported on their spouse's behavior, not their own. Sample items included "[In the past 3 months did your mom] …ask you for your opinion about an important matter?", "…help you do something that was important to you?," "...act supportive and understanding toward you?"

***Parental Hostility***

Parental hostility was assessed using 8 items from the Iowa Parenting Scale (Conger & Conger, 2002). Sample items included "When your mom asks you to do something and you don't do it right away, how often does your mom give up?" and "When you don't understand why your mom makes a rule for you to follow, how often does your mom explain the reason?"

Children and parents also completed the 13-item hostility subscale of the BARS. Parents only reported on their spouse's behavior, not their own. Sample items included "Shout or yell at you because she was mad at you" and "Tell you she is right and you are wrong about things".

***Parental Monitoring***

Parents and children completed a 14-item scale adapted from a measure developed by Small (personal communication, 2005). Sample items included “If you were going to get home late, you were expected to call your mom.” and “Your mom knew who your friends were.” Parents reported about both their own behavior.

***Relationship Quality***

Parents and children completed a 5-item scale. Sample items include “How happy are you with the way things are between you and your dad?” and “How much do you talk to your mom about things that you don’t want others to know?” Parents reported about both their own relationship with the child and their spouse’s relationship.

***Dyadic versus target behavior***

Each item in the scales above was categorized dyadic (descriptive of behavior of both dyad members) or target behavior (descriptive of only the parent’s behavior). For example, dyadic behaviors include, "You and your dad ignored each other," while target behaviors include, "Argue with you whenever you disagreed about something."

**Data Analysis**

***Aim 1: Estimate the degree of agreement among parent and child ratings of parent behavior/relationship dynamics.***

Next, parent-child agreement was estimated using multilevel models, which allow us to use all data simultaneously while accounting for the dependency of responses from the same individuals across time and from individuals within the same family. Moreover, these models provide an advantage over correlations in that they allow for adjustment from normative behavior and tests of moderating variables.

We incorporated a cross-level structure that accounts for within-rater dependencies. Rather than pre-standardizing responses, we retained raw scores and included relevant adjustments in model estimation. We report standardized estimates from these models, ensuring that within-rater dependencies were properly modeled while maintaining interpretability of the results. The baseline multilevel model included random intercepts at the family, rater, and target levels, allowing for variation in parent-child agreement across these nested levels. Additionally, we modeled the slope of parent ratings as varying across rater and family, capturing the variability in agreement across different dyads. Intercepts were allowed to vary across items to account for variability in item difficulty. We also control for the "normative" rating of each item, or the average rating across all targets on that item. This separates the normative effect -- the degree to which children see their parents as average -- from the distinctive effect, or the degree to which children agree with their parents about their unique parenting behavior (Wood & Furr, 2016). The normativity slope was fixed across targets.

The baseline multilevel model is as follows. At Level 1, we model agreement on each response *i* for target parent *l* between child and parent rater *k* within family *j*:

$$\text{Child rating}_{ijkl} = \beta_{0jkl} + \beta_{1jkl}(\text{Parent rating})_{ijkl} + \beta_2(\text{Normative})_{ijkl} + \epsilon_{ijkl} + v_m$$

$B_{0jkl}$ represents the intercepts (or average item rating) of a child in family *j* of target *l*, and $\beta_{1jkl}$ is the slope (or relationship between child rating and parent rating) for that child and rater *k*. Intercepts and the slope of child rating on parent rating were allowed to vary across targets, raters, and families, but the normative slope is held constant. For this baseline model, we allowed the intercepts and slopes to vary across targets nested within raters nested within families. Intercepts are additionally allowed to vary across items ($v_m$).

At Level 2, responses were nested within target *l*, which were in turn nested within rater *k:*

$$B_{0jkl} = \gamma_{00jk} + \mu_{0jkl}$$

$$B_{1jkl} = \gamma_{10jk} + \mu_{1jkl}$$

Where $\gamma_{00jk}$ is the mean rating for a given rater *k* in family *j* and $\gamma_{10jk}$ is the mean slope or agreement for a given rater *k* in family *j.* The coefficient $\mu_{0jkl}$ indexes the degree to which a target parent is consistently rated higher or lower and the coefficient $\mu_{1jkl}$ is the random slope for target parents.

Finally, at level 3, raters *k* are nested within family *j:*

$$\gamma_{00jk} = \gamma_{000} + \mu_{00j} + \mu_{00jk}$$

$$\gamma_{10jk} = \gamma_{100} + \mu_{10j} + \mu_{10jk}$$

Where $\gamma_{000}$ is the grand mean response across all items and all families and $\gamma_{100}$ is the grand mean slope. The latter is the primary target of investigation for this first model -- typical agreement -- but coefficients that index variability are also of interest. More specifically, subsequent models incorporated item-level, target-level, rater-level, and family-level covariates to determine the degree to which those explain variability in parent-child agreement.

To test whether parent–child agreement differs when ratings focus on a specific person (e.g., mother, father) versus the relationship as a whole, we used the manually coded dyadic vs. target variable (see Table 1). This binary variable was included as a Level 1 moderator:

$$Child\ rating_{ijkl} = \beta_{0jkl} + \beta_{1jkl}\ Parent\ rating_{ijkl} + \beta_2\ Normative_i + \beta_3\ Behavior\ Type_{ijkl} + \beta_4\ (Parent\ Rating_{ijkl} \times Behavior\ Type_{ijkl}) + \epsilon_{ijkl} + \nu_m$$

...

$$\beta_{3jkl} = \gamma_{30jk}$$

$\beta_{4jkl}=\gamma_{40jk}$

To test whether parent or child gender or gender match between child and parent affects agreement, we modified the baseline equation by adding child gender and gender match to the Level 2 equations (i.e., predicting the intercept value and slope of parent rating):

$\beta_{0jkl}=\gamma_{00jk}+\gamma_{01}Child\ Gender_{kl}+\gamma_{02}Gender\ Match_{kl}+\gamma_{03}(Child\ Gender\ x\ Gender\ Match)_{kl}+\mu_{0jkl}$

$\beta_{1jkl}=\gamma_{10jk}+\gamma_{11}Child\ Gender_{kl}+\gamma_{12}Gender\ Match_{kl}+\gamma_{13}(Child\ Gender\ x\ Gender\ Match)_{kl}+u_{1jkl}$

To determine whether parents agreed with children more when rating their own or their spouse's behavior, we included a binary predictor at Level 2:

$\beta_{0jkl}=\gamma_{00jk}+\gamma_{01}Self\ Report_{kl}+\mu_{0jkl}$

$\beta_{1jkl}=\gamma_{10jk}+\gamma_{11}Self\ Report_{kl}+\mu_{1jk}$

To determine whether parents agreed with children more when rating warmth and support or hostility and conflict or monitoring, we included a categorical moderator at Level 1:

$Child\ rating_{ijkl}=\beta_{0jkl}+\beta_1\ Parent\ rating_{ijkl}+\beta_2\ Normative_i+\beta_3 Scale\ Type_i+\beta_4\ (Parent\ Rating\times Scale\ Type)_{ijkl}+\epsilon_{ijkl}+v_m$

...

$\beta_3=\gamma_{30}$

$\beta_4=\gamma_{40}$

To what extent does parent-child agreement increase from age 10 to 16?

We test whether the patterns identified in Models 1B, 1C, and 1D are moderated by child age. An example equation is below:

$$Child\ rating_{ijkl} = \beta_{0jkl} + \beta_1\ Parent\ rating_{ijkl} + \beta_2\ Normative_i + \beta_3 Scale\ Type_i + \beta_4\ (Parent\ Rating \times Scale\ Type)_{ijkl} + \beta_5 Child\ age_i + \epsilon_{ijkl} + \nu_m$$

...

$$\beta_5 = \gamma_{50}$$

## Results

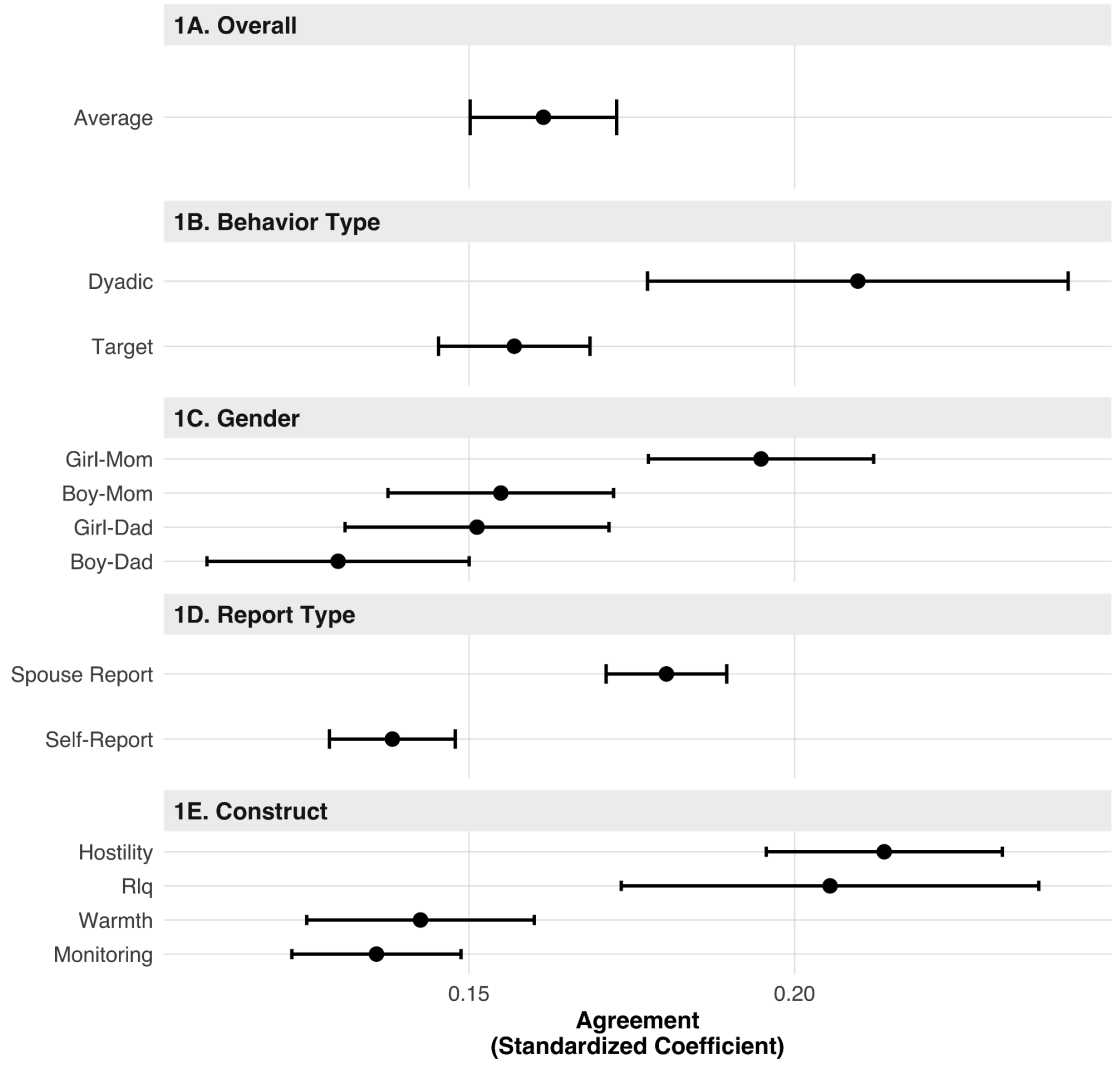
**Aim 1: Estimate the degree of agreement among parent, child, and coder ratings of parent and child behavior.**

First, child ratings were modeled as a function of parent ratings, normative item averages, and random effects for families, raters, and targets. The key slope of interest was the parent-child agreement parameter. The standardized partial parent-child agreement slope was positive and moderate (slope $b$ =.16), indicating that parents' reports predicted childrens' reports even after accounting for normative item profiles. This indicates that when parents reported higher levels of warmth, hostility, or monitoring, children tended to report higher levels as well.

Variability around this average was substantial. Agreement slopes varied across families, raters, and items, with some dyads showing very high alignment (97.5th percentile correlation = .88) and others showing little to no agreement (2nd percentile = -.17). Intercepts also varied widely, reflecting differences in families' overall reporting levels, independent of agreement. In sum, the baseline model suggests that while parents and children tend to agree on average, there is marked heterogeneity across families, which motivates the moderator analyses presented below.

**Figure 2.**

*Combined figure of all child and parent rating associations.*

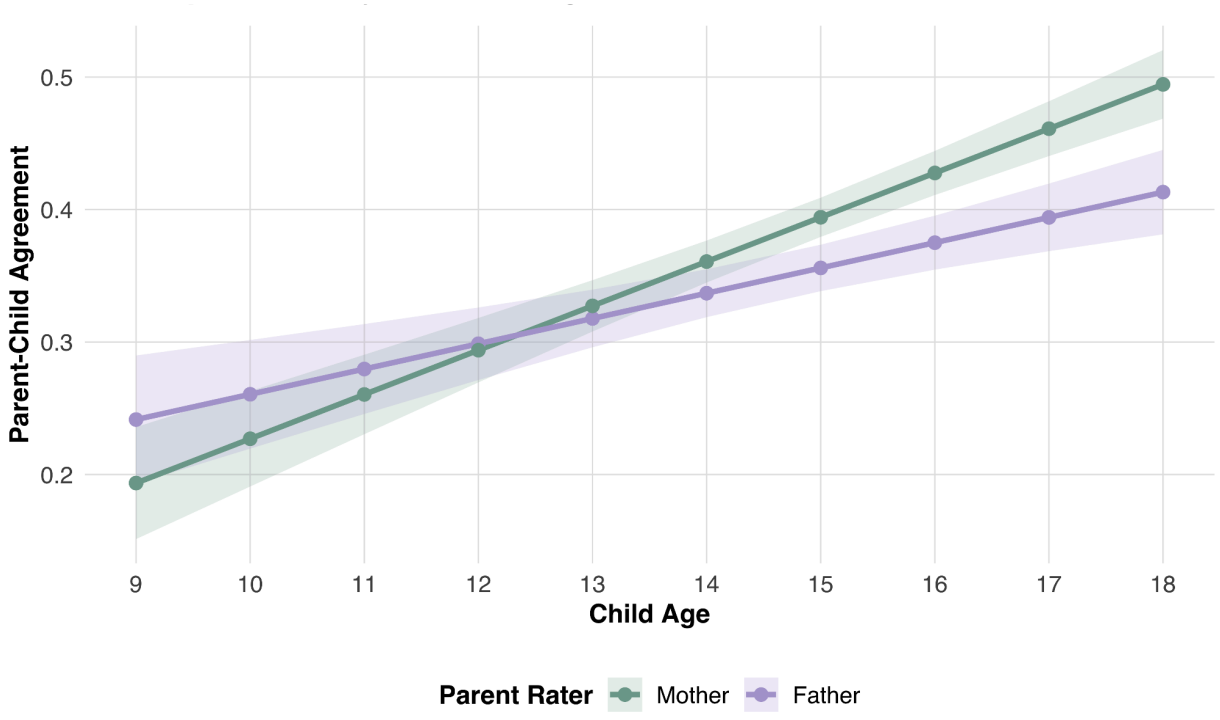



Agreement was stronger on dyadic scales ($b$ = .21, 95% CI [.18, .24]) than on target-specific scales ($b$ = .16, 95% CI [.15, .17]), suggesting that parents and children aligned more closely when asked about their shared relationship. Gender was also significantly related, with agreement high in daughter-mothers gender-matched dyads while in father-son

gender-matched dyads, agreement was low. Agreement also differed by construct, being strongest for hostility ($b$ = .21, 95% CI [.20, .23]) and relationship quality ($b$ = .21, 95% CI [.17, .24]) but lower for warmth ($b$ = .14, 95% CI [.13, .16]), and monitoring ($b$ = .13, 95% CI [.12, .16]). Finally, agreement increased modestly from ages 10 to 16, particularly in father–child dyads. Monitoring remained consistently low across development, while warmth and hostility showed upward trajectories.

**Figure 3.**

*Developmental Trajectories of Agreement*

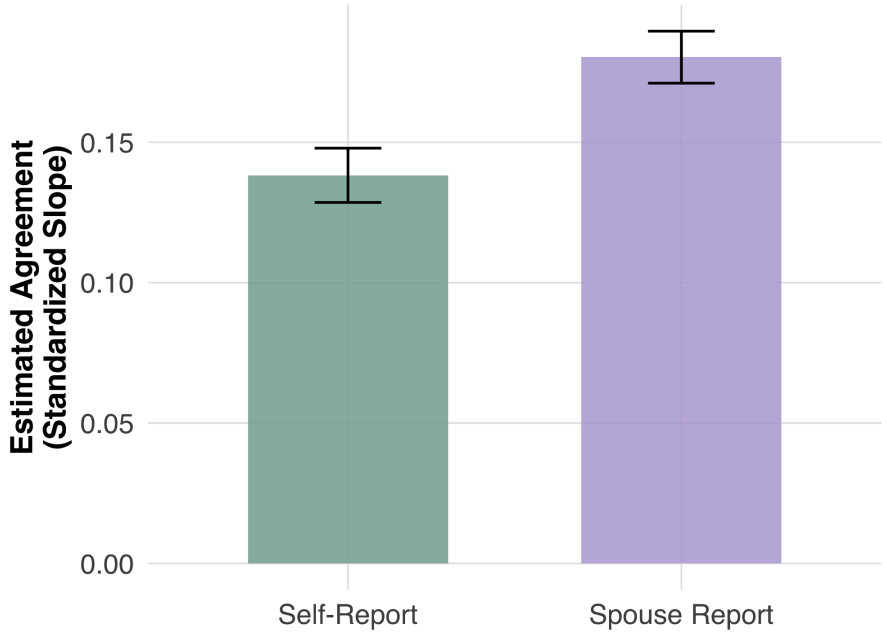



*Note:* This graph depicts the trend of standardized parent ratings across child age, with separate trajectories for two different raters. The shaded region around each line is the 95% confidence interval for the estimated agreement at each child age. The trend indicates that ratings from both raters increase with child age, but with differing slopes and variability.

Parent-child agreement was higher when parents rated their spouse (slope = .18, 95% CI [.17, .19]) than when parents rated themselves (slope = .14, 95% CI [.13, .15]).

**Figure 4.**

*Child-parent agreement by report type.*




## Discussion

The present study examined parent-child agreement in perceptions of parenting behaviors and relationship dynamics from middle childhood to late adolescence in Mexican-origin families, using multi-informant reports and observational data. Building on developmental perspectives that emphasize adolescence as a period of renegotiated autonomy, shifting family roles, and changing communication demands (Choudhury et al., 2012; Smetana & Rote, 2019), we studied whether parents and youth see parenting similarly, whether agreement changes across development, and how family perceptions align with independent observers. Overall, agreement was moderate on average but highly variable across families, underscoring that discrepancies are

not rare measurement noise, but a meaningful and heterogeneous feature of family life during adolescence.

**Key findings**

Across parenting domains, parents and children tended to agree moderately, but agreement differed substantially across dyads. This variability suggests that perceptual alignment is not a stable family trait, but something that may reflect differences in relationship processes, communication patterns, or interpretive frameworks within families. Importantly, agreement was stronger for dyadic constructs (e.g., overall relationship quality) than for target-specific behaviors (e.g., warmth). This pattern is consistent with the idea that shared relational experiences may be easier for both parties to recognize and summarize than specific parenting behaviors, which can be interpreted differently depending on role expectations and subjective meaning (Cook & Goldstein, 1993).

Construct-specific differences were also pronounced. Hostility and relationship quality showed the strongest agreement, whereas monitoring showed the weakest. One interpretation is that hostile behaviors may be more salient, concrete, and memorable, making them easier to identify consistently across informants (Baumeister et al., 2001; Fiske, 1980; Taylor, 1991). In contrast, monitoring and warmth may be more ambiguous and role-dependent (Hou et al., 2020; Korelitz & Garber, 2016). Adolescents may interpret monitoring as control or intrusion, whereas parents may view it as care or responsibility. Similarly, warmth may be expressed in ways that are subtle or indirect, leading to differences in what parents intend versus what youth perceive. These findings reinforce that parenting is multidimensional, and that agreement depends on the behavioral domain being assessed rather than reflecting a general tendency for parents and children to agree.

Parents showed greater alignment with children when rating their spouse's behavior compared to rating their own, consistent with research suggesting that self-reports may be shaped by self-enhancing biases or limited awareness of one's own behavior (Bögels & Melick, 2004; El-Alayli & Wynne, 2015). This distinction highlights the importance of separating parent self-reports from spouse-reports in family research, as they are not interchangeable indicators of parenting. More broadly, these results emphasize that "agreement" is partly a function of informant perspective, with each reporter contributing a valid but partial view shaped by their role in the family system.

Gender differences emerged in parent-child agreement, with mother-daughter dyads showing the strongest agreement and father-son dyads the weakest. These findings align with prior work suggesting that gender socialization shapes relationship expectations and communication styles (Leaper & Friedman, 2007; Odenweller et al., 2013), potentially affecting how parenting behaviors are interpreted and discussed. For example, daughters may be more attuned to relational cues and emotional dynamics, supporting greater alignment with mothers, whereas sons may be socialized toward autonomy and reduced emotional disclosure, which could limit perceptual overlap. These patterns underscore that agreement is not only about parenting behavior itself, but also about how family members communicate, attend to, and interpret relational experiences.

Contrary to some prior studies suggesting that parent-adolescent agreement declines across adolescence (Rajmil et al., 2013; Safford et al., 2005), agreement in the present study increased modestly from ages 10 to 16, especially in father-child dyads. This developmental increase may reflect adolescents' growing cognitive maturity and perspective-taking abilities, supporting a more nuanced understanding of parental intentions and accurate recall of family

patterns. It may also reflect reciprocal adaptation, as parents and youth adjust to changing autonomy needs and family roles across adolescence. At the same time, because father-child agreement started lower, the stronger developmental increase could partly reflect greater room for change rather than a uniquely father-driven developmental process. Together, these findings suggest that discrepancies may shift across adolescence in ways that are not uniformly negative or inevitable, and that agreement itself may represent an evolving developmental process.

A key contribution of this work is that it extends multi-informant agreement research to Mexican-origin families, an understudied population in developmental science. This cultural context is important for interpreting parent-adolescent dynamics because norms surrounding family relationships and parenting shape how behaviors such as monitoring, discipline, and warmth are expressed and perceived. However, consistent with the limits of the current design, we cannot empirically test cultural mechanisms because cultural values were not measured directly. Thus, cultural explanations should be treated as contextual possibilities rather than conclusions. Future research should include direct assessments of culturally relevant values, parenting meanings, and family narratives to clarify when and how cultural context shapes agreement trajectories and discrepancy processes.

**Methodological implications and future directions**

These findings highlight the value of multi-informant, longitudinal approaches that treat agreement as a construct of interest rather than a statistical nuisance. Construct-specific patterns indicate that researchers should avoid relying solely on composite parenting scores, as agreement processes differ meaningfully across domains.

The sample was drawn from Mexican-origin families in California. This is not inherently a limitation – Mexican-origin families are an important and historically underrepresented

population in developmental and family research–but it is important to note that patterns of parent-child agreement observed here may not generalize in the same way to families from other cultural, national, linguistic, and socioeconomic contexts, or even Mexican-origin families in other regions. Future research should examine mechanisms that predict agreement trajectories (e.g., communication quality, stress, adolescent disclosure, and emotional regulation) and test whether discrepancies in specific domains (especially monitoring and relationship quality) predict adolescent mental health outcomes, distinguishing normative divergence from patterns that signal relational risk.

**Conclusion**

Parent-child agreement in parenting perceptions is not a static marker of accuracy, but a developmentally patterned and domain-specific feature of family relationships. In this study, perceptual alignment was moderate on average, varied widely across families, was strongest for dyadic and high-salience domains, and increased modestly from middle childhood to adolescence, particularly for father-child dyads. By integrating multi-informant, observational, and longitudinal data, these findings support a nuanced view in which discrepancies are expected, informative, and potentially central to understanding how families navigate the developmental challenges and growth opportunities of adolescence.

# CHAPTER 4 - STUDY 3

# SELF-CONCEPT AND PERSONALITY DEVELOPMENT IN ADOLESCENCE

## Introduction

Adolescents construct their self-perceptions – the broad, evaluative lens through which they come to understand who they are across the many domains of their lives (Harter, 2012b) – based on feedback from peers, parents, and their broader social environment. Self-perception is associated with temperament, with positive self-perception linked to approaching, flexible, and positive mood patterns (Klein, 1995). Self-perception appears closely linked to traits such as extraversion and neuroticism; for instance, adolescents with a positive self-image tend to display higher levels of extraversion and openness to experience, while those with a negative self-view may exhibit neuroticism, anxiety, and insecurity (Harter, 2012b). Self-esteem refers to the evaluative judgement one makes about oneself overall, including general feelings of happiness and satisfaction with the kind of person one is (Dusek & McIntyre, 2006; Manning, 2007). As one distinct dimension within the broader landscape of self-perception, the Big Five personality dimensions account for 34% of the variance in self-esteem with high self-esteem individuals typically being emotionally stable, extraverted, and conscientious (Robins et al., 2001). Conversely, self-esteem instability – the degree to which feelings of self-worth fluctuate from day-to-day – is negatively associated with emotional stability, agreeableness, and conscientiousness (Zeigler-Hill et al., 2015).

There is a clear distinction between global self-worth – often equated with self-esteem, and reflecting how much one likes oneself as a person overall – and domain-specific self-concepts, which refers to adolescents' evaluations of their competency or adequacy in particular areas such as academics, social skills, or behavior conduct (Harter, 2012b; Manning,

2007). Where self-esteem captures the overall evaluative judgments one makes about oneself as a person, and self-perception encompasses the full range of these self-evaluations across life domains, domain-specific self-concept describes the structured, content-specific beliefs adolescents hold about their abilities within each particular area. Importantly, global self-worth is not simply a sum of these domain-specific judgements, but rather is its own qualitatively distinct appraisal (Harter, 2012b). Global self-worth has significant implications for personality growth because high self-esteem is a predictor of future success and well-being across various life domains, including relationships, career, and health (Orth & Robins, 2014), and these outcomes in turn are believed to reinforce and shape ongoing personality growth. Adolescents with positive self-perceptions and strong global self-worth tend to exhibit emotional stability, sociability, and responsibility into adulthood (Palenzuela-Luis et al., 2022). Conversely, low self-esteem frequently co-occurs with internalizing disorders in young people, especially when anxiety and depression are comorbid (Keane & Loades, 2017).

The mechanism through which personality and self-perception might influence one another over time remains underexplored. Personality traits may shape self-perceptions by organizing the kinds of social experiences adolescents seek out and how they interpret evaluative feedback from others. Traits like agreeableness and extraversion influence approach motivation, interpersonal behavior, and the quality of social interactions (Graziano & Tobin, 2009; Jensen-Campbell et al., 2003), which in turn generate feedback from peers and parents that adolescents incorporate into their self-views (Cassidy et al., 2003; Pfeifer et al., 2009). From this perspective, personality functions as an upstream influence that structures adolescents' social environments and thereby shapes the self-evaluative information they are exposed to, influencing both the overall evaluative quality of self-esteem and the domain-specific content of

self-concept. Temperament-based models similarly position dispositional tendencies as organizing systems through which self-concept emerges as a downstream product of social engagement (Klein, 1995).

Self-perceptions may also influence personality development through a different set of mechanisms. According to self-regulatory models of personality development, self-evaluations can motivate behavioral change when they are experienced as discrepant from one's ideal self (Hudson & Fraley, 2015). An adolescent who perceives themselves as socially unskilled may withdraw from peer contexts, reducing opportunities for the kinds of social practice and corrective feedback that could shape interpersonal dispositions over time. Conversely, an adolescent with a strong athletic self-concept may seek out competitive and team-based contexts with greater confidence, reinforcing extraversion and conscientiousness over time. Over repeated behavior cycles, these self-perception-driven tendencies could accumulate into trait-level change (Lodi-Smith & Roberts, 2007). Self-perceptions may also shape personality indirectly through their effects on daily affect and motivation, which are known to influence trait expression and consolidation during adolescence (Klimstra, 2013; Shiner, 2015; Shiner & Caspi, 2003).

Despite the extensive research on global self-worth and its links to personality, limited work has been done looking at the relationship between domain-specific self-perceptions and personality traits longitudinally. The present study aims to address this gap by examining how self-perceptions of competence in specific domains, alongside global self-worth, relate to personality traits across time in adolescents. This approach is different from previous research that primarily focuses on self-esteem as a unitary construct, offering a more nuanced understanding of how adolescents' perceived abilities in various areas may contribute to their broader personality development.

# Methods

## Data collection

This study draws on data from the Transitions in Adolescent Girls (TAG) project (for protocol, see Barendse et al., 2020), an ongoing longitudinal study examining developmental transitions. See Chapter 2 for demographic information. Participants completed questionnaires at each of five waves, spaced 1.5-2 years apart. At each wave, participants completed two sessions approximately one month apart, and questionnaires were administered during this window.

## Measures

*Global self-worth and domain-specific self-concepts* were measured by using self-reports of the Self-Perception Profile for Adolescents (SPPA; Harter, 2012). Participants completed this survey at each wave. The TAG study utilized 7 of the original 9 subscales; romantic appeal and job competence subscales were not collected at Wave 1 as participants were too young for these domains to be applicable. Romantic appeal was added for later waves but was not included in this study. Examples of SPPA questions include:

- "A. Some people feel that they are just as smart as others their age." or "B. Other people aren't so sure and wonder if they are as smart.";
- "A. Some people find it hard to make friends." or "B. Other people find it pretty easy to make friends."; and
- "A. Some people are not happy with the way they look." or "B. Other people are happy with the way they look."

After selecting a statement, participants were asked to decide "if this is "sort of true" or "really true" for you." I recoded answers to the 70 SPPA questions to generate scores with 4 response options: (1) *Option A really true*, (2) *Option A sort of true*, (3) *Option B sort of true*,

and (4) *Option B really true*. Items were reverse-coded such that higher scores reflect more positive self-perceptions across all domains. Cronbach's α was .78 for scholastic competence, .84 for social competence, .90 for athletic competence, .92 for physical appearance, .79 for behavioral conduct, .87 for close friendship, and .89 for global self-worth. $\omega_h$ was .84 for scholastic competence, .87 for social competence, .91 for athletic competence, .95 for physical appearance, .83 for behavioral conduct, .88 for close friendship, and .91 for global self-worth.

*Personality* was measured using self-reports of The Big Five Inventory 10 Item Scale (BFI-10; Rammstedt & John, 2012). The BFI-10 is a brief assessment of the five major personality dimensions with two items per trait–extraversion, agreeableness, conscientiousness, neuroticism, and openness. Example items include "I see myself as someone who is generally trusting." and "I see myself as someone who is reserved." Participants rated each item on a 5-point scale ranging from 1 (disagree strongly) to 5 (agree strongly). Participants completed this survey at each wave. Because Cronbach's α and omega cannot be estimated for two-item scales, only the correlations are reported for BFI-10 subscales. The correlations were .35 for extraversion, .26 for agreeableness, .32 for conscientiousness, .46 for neuroticism, and .07 for openness. These values are consistent with the known psychometric limitations of the BFI-10, for which agreeableness and openness are consistently the weakest scales across validation studies (Balgiu, 2018; Rammstedt & John, 2012). The openness correlation in particular ($r$ = .07) suggests the two items captured largely unrelated content in this sample, which is unsurprising given that the items were deliberately selected to maximize bandwidth rather than redundancy. Findings involving openness should therefore be interpreted with caution.

**Analysis plan**

First, the empirical structure of the SPPA items was estimated from the covariance

matrix, which was calculated using pairwise deletion (i.e., using all responses provided by participants even when there is missing data). I pooled all responses from all participants (up to five time points per individual). A benefit to this pooled approach is that the extracted factor structure is based on all available data and therefore serves as a good baseline from which to assess change in structure across development. However, a key limitation is that it does not account for dependency within individuals, potentially inflating factor loadings or introducing artificial stability.

Structure was assessed via exploratory factor analysis (EFA) with an oblimin rotation. To determine the optimal number of factors, I examined multiple fit indices, including Very Simple Structure (VSS) complexity, empirical Bayesian Information Criterion (BIC), and Root Mean Square Residual (SRMR). VSS complexity helps identify the most interpretable factor solution by assessing how well items load onto a small number of factors, with higher values indicating a better fit for simpler structures. The empirical BIC is used to compare models, with lower values suggesting a more parsimonious and better-fitting solution. SRMR assesses the discrepancy between the observed and predicted correlation matrices, with lower values indicating a better fit. Additionally, I inspected scree plots to look for an "elbow" in the eigenvalues, where the slope of the curve levels off, indicating the optimal number of factors. A combination of these approaches ensured that both statistical fit and interpretability were considered when determining the best factor solution. RMSEA < .05 was used as an additional criterion for model fit. The number of factors was selected based on the point at which these indices indicate diminishing returns, meaning that additional factors no longer substantially improved fit. Specifically, I tried to identify the point at which VSS complexity, empirical BIC, and SRMR plots plateau, suggesting that further factors did not meaningfully contribute to explaining variance in the data.

However, these indices disagreed, so I prioritized interpretability and theory alongside statistical fit.

Factor loadings of .40 or higher were used as the criterion for retention, as this threshold is commonly recommended to ensure that items meaningfully contribute to their respective factors (Howard, 2016; Perry et al., 2015). Research suggests that items with loadings <.40 may not adequately represent the underlying construct and could introduce measurement error. A .40 cutoff ensured that retained items contribute meaningfully to the identified factors. After establishing the empirical structure using EFA, I then used Confirmatory Factor Analysis (CFA) to test for longitudinal measurement invariance.

Model fit was evaluated using standard CFA indices and thresholds (Van De Schoot et al., 2012), including CFI > .90, TLI > .90, RMSEA < .05, and SRMR < .08. Measurement invariance across time was assessed through hierarchical model comparisons, testing configural, metric, and scalar invariance. Configural invariance ensures that the factor structure remains consistent over time, while metric invariance evaluates the stability of factor loadings. Finally, scalar invariance examines whether item intercepts remain stable, indicating that observed scores are comparable across time points. Fit indices guided invariance assessment, with changes in CFI (< .01), TLI (< .01), RMSEA (< .005), and SRMR (< .005) signaling potential violations (Putnick & Bornstein, 2016). Establishing measurement invariance is a necessary step before moving on to the main analyses, because meaningful comparisons of latent means and cross-lagged associations across time require that the construct is measured equivalently at each wave.

## Random Intercept Cross-Lagged Panel Model (RI-CLPM)

Following the establishment of the factor structure and longitudinal measurement invariance for the Big Five Inventory-10 (BFI-10) and the Self-Perception Profile for Adolescents (SPPA), I examined longitudinal associations between personality traits and domain-specific self-perceptions using Random Intercept Cross-Lagged Panel Models (RI-CLPMs). The RI-CLPM decomposes variance into a stable, between-person component and a dynamic, within-person component, thereby separating trait-like individual differences from state-like fluctuations over time (Mulder & Hamaker, 2021). This approach allows for the estimation of reciprocal effects between constructs over time while controlling for time-invariant between-person differences that could otherwise confound cross-lagged associations. For each model, autoregressive paths (the effect of a variable on itself at the next wave) and cross-lagged paths (the effect of one variable on another at the next wave) were constrained to be equal across waves. Random intercepts were specified for both constructs in each model to capture stable between-person differences. Models were estimated using full information maximum likelihood (FIML) to handle missing data. Statistical significance was evaluated at $p < .05$, with false discovery rate (FDR) correction applied within each trait-domain pair to account for multiple comparisons across paths within a given model.

### *Construction of self-perception and personality variables*

For each of the SPPA domains, I computed wave-specific composite scores by summing the corresponding items at each of the five measurement timepoints (Waves 1-5). Higher scores indicated more positive self-perception in that domain. BFI-10 personality traits – neuroticism, agreeableness, extraversion, conscientiousness, and openness – were scored at each wave as

described earlier. For the present analyses, I used observed composite scores for each trait at each wave (1-5).

***Model specification***

For each model, I specified a random intercept factor for the self-perception domain and a random intercept for the personality trait. All factor loadings from the observed scores (Waves 1-5) to their respective random intercepts were fixed to 1, capturing stable, time-invariant between-person differences across the five measurement occasions. These random intercepts represent trait-like levels of self-perception and personality for each individual.

Within-person dynamics were modeled at the level of wave-specific deviations from these random intercepts. For each construct, I specified first-order autoregressive paths such that each wave score was regressed on the same construct at the prior wave (e.g., Wave 2 appearance on Wave 1 appearance, Wave 5 appearance on Wave 4 appearance). These autoregressive paths capture within-person stability in deviations from one's own typical level over time.

To test bidirectional longitudinal associations between personality traits and self-perceptions, I included cross-lagged paths in both directions at each lag. Specifically, each self-perception domain score at Wave T was regressed on the corresponding personality trait at Wave T-1 (e.g., Wave 2 appearance on Wave 1 neuroticism, Wave 5 appearance on Wave 4 neuroticism), and each personality trait score at Wave T was regressed on the self-perception domain at Wave T-1 (e.g., Wave 2 neuroticism on Wave 1 appearance, Wave 5 neuroticism on Wave 4 appearance). These cross-lagged parameters estimate whether within individuals, higher or lower than usual levels of one construct predict subsequent deviations in the other construct, over and above autoregressive carry-over.

Autoregressive and cross-lagged paths were constrained to be equal across lags. Random intercepts for the two constructs were allowed to covary, capturing stable between-person associations. To aid identification and model convergence, I constrained the intercepts (means) of later waves to be equal within each construct, thereby modeling a common grand mean level across time while focusing inference on within-person processes.

All models were estimated in R using the *lavaan* package (Rosseel, 2012), with full information maximum likelihood (FIML) to handle missing data under the assumption of missing at random.

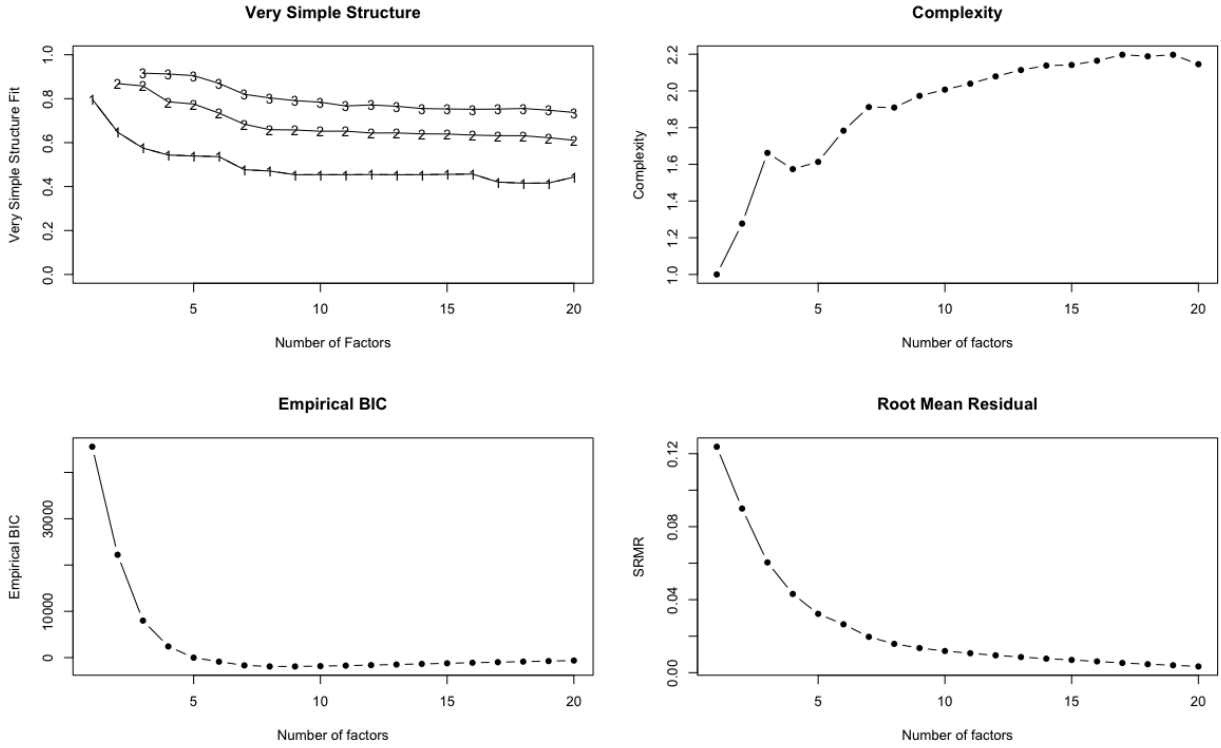
## Results

### What is the factor structure of the SPPA?

I first examined the factor structure of the SPPA at each wave to evaluate its stability over time. As shown in Figure 1, the empirical BIC dropped sharply through 5 factors and then leveled off, suggesting that additional factors beyond that point added little. SRMR continued to decrease gradually across all factor solutions and did not point to a clear cutoff. VSS complexity peaked around 3-4 factors. Because these indices pointed to different solutions, factor solutions ranging from 4 to 9 were examined and compared for both statistical fit and interpretability. The 7-factor solution was selected because it had the strongest and most interpretable loadings, with factors corresponding closely to the original subscales (Harter, 2012b).

**Figure 1.**

*Fit indices used to determine the optimal number of factors in the SPPA. Plots show Very Simple Structure (VSS) fit, item complexity, empirical BIC, and root mean square residual (SRMR) across solutions ranging from 1 to 20 factors.*




The EFA indicated that a 7-factor solution provided the best fit to the data (see Figure 1). Accordingly, analyses in the present study were conducted using the empirically supported 7-factor solution. According to the SPPA manual, items are organized into the following subscales: physical appearance (items 7, 21, 35, 49, 63), athletic competence (items 5, 19, 33, 47, 61), close friendships (items 11, 25, 39, 53, 67), social competence (items 3, 17, 31, 45, 59), global self-worth (items 13, 27, 41, 55, 69), scholastic competence (items 1, 15, 29, 43, 57), and behavioral conduct (items 9, 23, 37, 51, 65). The empirically derived factor structure from the present study closely replicated this organization with a few notable exceptions (see Table 1). Item 13 (originally a global self-worth item) loaded onto the physical appearance factor, item 69 (originally global self-worth) cross-loaded onto both physical appearance and global self-worth, item 39 (originally close friendships) cross-loaded onto both close friendships and social acceptance, and item 1 (originally scholastic competence) did not meet the .40 loading threshold

on any factor.

**Table 1.**

*EFA factor loadings for 7-factor solution*

| Item | ML1 | ML3 | ML2 | ML7 | ML6 | ML4 | ML5 |
|---|---|---|---|---|---|---|---|
| SPPA 21 | .89 | | | | | | |
| SPPA 35 | .88 | | | | | | |
| SPPA 7 | -.87 | | | | | | |
| SPPA 63 | .73 | | | | | | |
| SPPA 49 | .60 | | | | | | |
| SPPA 13 | .40 | | | | | | |
| SPPA 5 | | .92 | | | | | |
| SPPA 19 | | .82 | | | | | |
| SPPA 33 | | .81 | | | | | |
| SPPA 61 | | .76 | | | | | |
| SPPA 47 | | .60 | | | | | |
| SPPA 11 | | | .79 | | | | |
| SPPA 25 | | | .76 | | | | |
| SPPA 53 | | | .74 | | | | |
| SPPA 67 | | | .67 | | | | |
| SPPA 39 | | | .50 | .41 | | | |
| SPPA 17 | | | | .71 | | | |
| SPPA 31 | | | | .65 | | | |
| SPPA 45 | | | | .63 | | | |
| SPPA 3 | | | | -.59 | | | |
| SPPA 59 | | | | .59 | | | |
| SPPA 55 | | | | | .62 | | |
| SPPA 41 | | | | | .54 | | |
| SPPA 37 | | | | | .53 | | |
| SPPA 69 | | | | | .46 | | |
| SPPA 27 | | | | | .41 | | |

| | | |
|---|---|---|
| SPPA 43 | .78 | |
| SPPA 29 | .66 | |
| SPPA 15 | .61 | |
| SPPA 57 | .49 | |
| SPPA 1 | | |
| SPPA 51 | | .74 |
| SPPA 65 | | .62 |
| SPPA 23 | | .61 |
| SPPA 9 | | .49 |

**Measurement invariance**

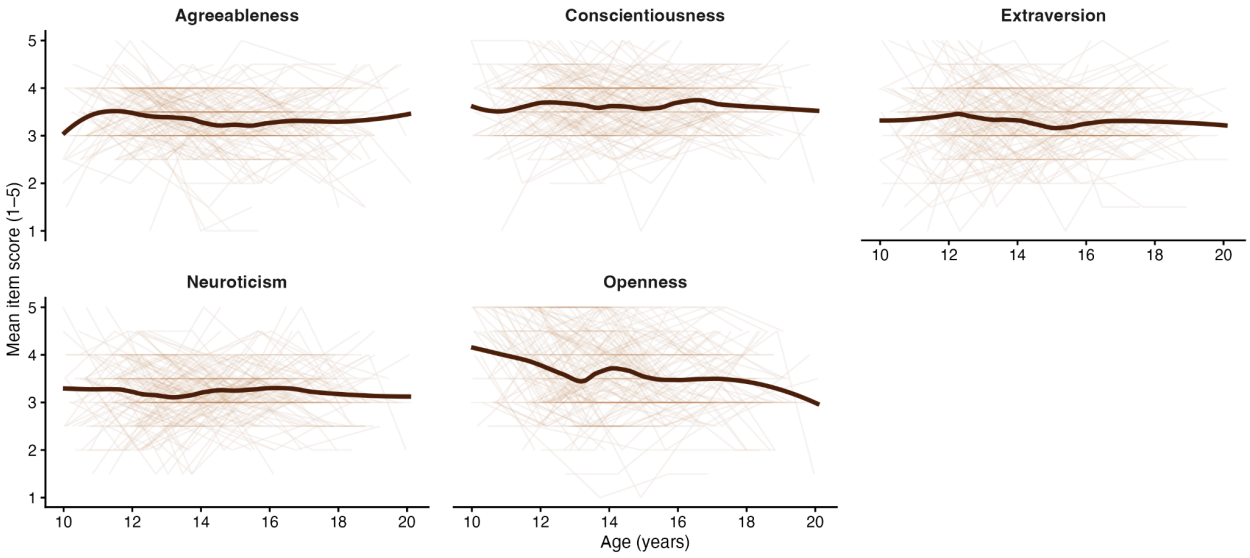
Longitudinal measurement invariance was evaluated for each SPPA subscale using a sequence of configural, weak, and scalar models. Figures 2A and 2B display individual trajectories and group mean trends across waves for each SPPA subscale and BFI-10 trait, illustrating the extent of within- and between-person variability that these models aim to account for. Physical appearance and athletic competence demonstrated support for scalar invariance, with all changes in CFI and RMSEA falling well below conventional thresholds across model comparisons ($\Delta CFI \leq .009$, $\Delta RMSEA \leq .002$; (Cheung & Rensvold, 2002; Putnick & Bornstein, 2016). Scholastic competence showed acceptable configural fit (RMSEA = .078, CFI = .918), but the weak invariance model produced changes that exceeded conventional thresholds ($\Delta CFI = -.019$, $\Delta RMSEA = .005$), suggesting factor loadings were not fully stable across time. Close friendship competence similarly showed borderline weak invariance ($\Delta CFI = .008$). Perceived social competence ($\Delta CFI = -.008$), global self-worth ($\Delta CFI = -.004$, $\chi^2$ p = .0003), and behavioral conduct ($\Delta CFI = -.029$, $\chi^2$ p = .012) all failed to meet criteria for weak invariance, indicating that factor loadings were not equivalent across waves for these subscales. Because weak invariance is a prerequisite for meaningful longitudinal comparison, results involving

social competence, scholastic competence, global self-worth, close friendship competence, and behavioral conduct are reported here for completeness and transparency, given that examining these associations was a primary aim of the study. However, the absence of metric invariance means that cross-lagged estimates for these subscales cannot be meaningfully interpreted. Readers should treat these results as uninterpretable.

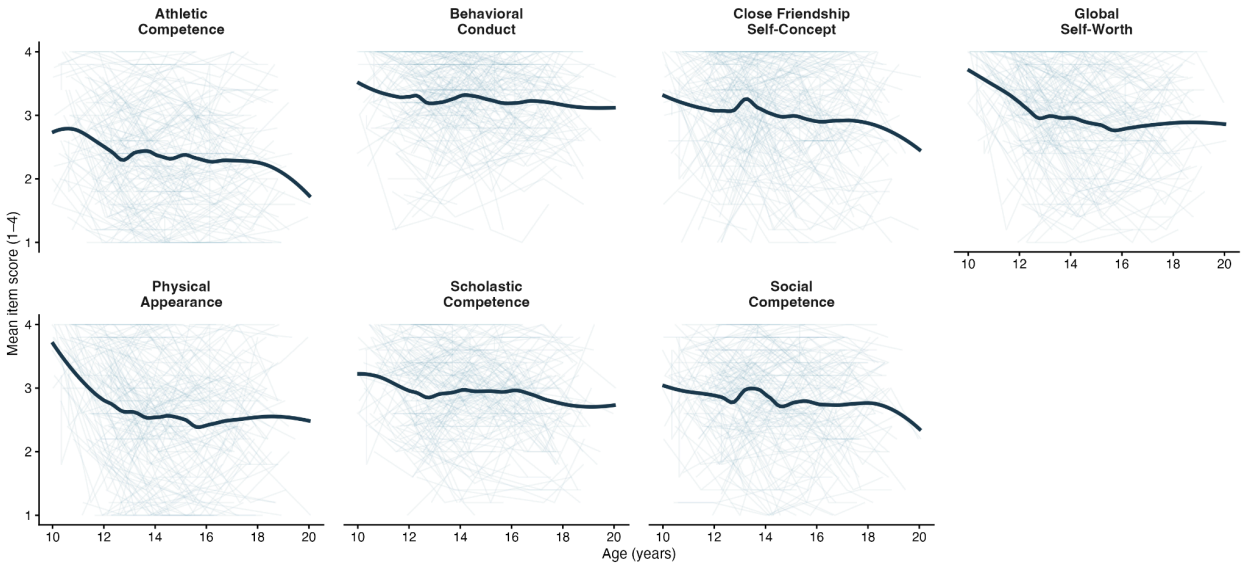
**Figure 2.**

*Individual trajectories of personality (BFI-10; A) and self-perception (SPPA; B) across adolescence.*

A) BFI-10



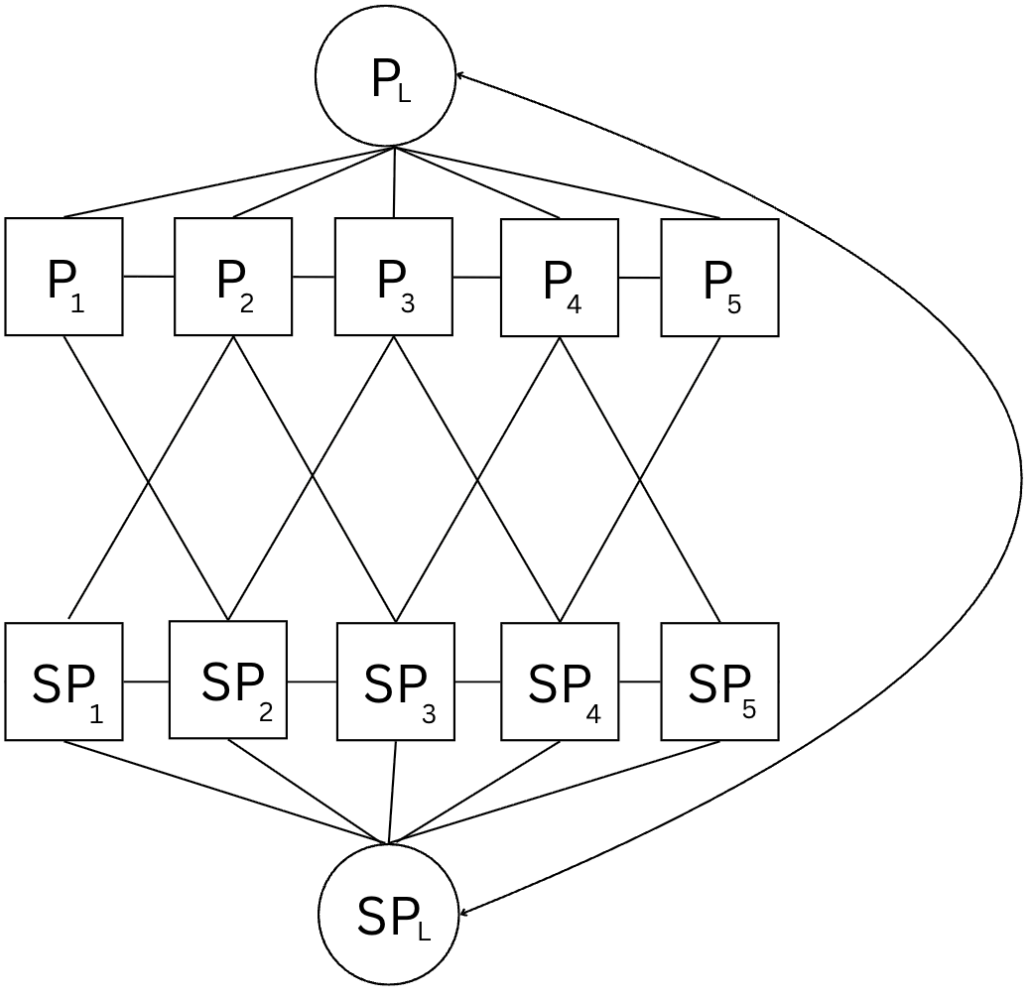

B) SPPA




*Note:* Each line represents a single participant tracked across five waves (ages ~10-20). The bold line reflects the group mean trajectory.

**Figure 3.**

*Random-Intercept Cross-Lagged Panel Model (RI-CLPM) for personality (P) and self-perception (SP) across five time points*




*Note:* Squares represent observed scores for personality ($P_1$–$P_5$) and self-perception ($SP_1$–$SP_5$) measured across five waves. Circles labelled $P_L$ and $SP_L$ represent latent, time-invariant random intercepts capturing stable, trait-like between-person differences in personality and self-perception. Straight horizontal lines reflect autoregressive effects within each construct (e.g., $P_t \rightarrow P_{t+1}$), and diagonal lines depict cross-lagged paths between constructs (e.g., $P_t \rightarrow SP_{t+1}$ and $SP_t \rightarrow P_{t+1}$). Loadings from observed variables onto the latent intercept factors represent the separation of stable between-person variance from within-person fluctuations over time.

**How does domain-specific self-perception relate to personality development?**

Having established the factor structure of the SPPA and confirmed measurement invariance, I examined longitudinal associations between personality traits and domain-specific self-perceptions using random intercept cross-lagged panel models. Full scalar invariance was only supported for physical appearance and athletic competence. Results for the remaining domains (scholastic competence, close friendship competence, perceived social competence, global self-worth, and behavioral conduct) have been reported for transparency but should not be interpreted given that measurement invariance was not established across waves.

Across self-concept domains, results revealed a highly consistent directional pattern (see Figure 4). Autoregressive paths indicated moderate and increasing stability over time for both personality traits and self-concept domains, with standardized coefficients ranging from approximately .13 to .35. These values suggest that within-person deviations from one's typical level were carried forward across waves, but not so strongly as to rule out meaningful change. This is a pattern consistent with moderate trait-like stability during a developmentally dynamic period. Cross-lagged effects of personality on self-perception were generally small in absolute magnitude. The most consistent and statistically significant effects emerged for agreeableness predicting physical appearance self-concept ($\beta \approx .15$ to .21) and global self-worth ($\beta \approx .13$ to .16), with higher agreeableness predicting higher subsequent self-perceptions in these domains across all wave transitions. No other personality-to-self-concept cross-lagged paths were significant after correcting for multiple comparisons.

At the between-person level, random intercept correlations revealed several robust stable associations (see Table 3). Agreeableness showed strong significant positive associations with all self-concept domains, most notably physical appearance ($r = .87$), global self-worth ($r = .99$),

and behavioral conduct ($r$ = .83). The random intercept correlation between agreeableness and global self-worth is notably high and should be interpreted with caution, suggesting that at the stable trait level, the two constructs are statistically near-indistinguishable in this sample. This is likely a consequence of the poor measurement invariance documented for the global self-worth subscale, which may have destabilized the random intercept and inflated its association with agreeableness. Substantive interpretation of this correlation is not recommended.

Conscientiousness showed moderate significant positive associations across all domains ($r$ = .43 to .56). Extraversion was significantly positively associated with physical appearance ($r$ = .53), athletic competence ($r$ = .52), close friendship competence ($r$ = .45), global self-worth ($r$ = .49), and perceived social competence ($r$ = .57). Neuroticism showed negative associations with physical appearance ($r$ = -.37), athletic competence ($r$ = -.44), global self-worth ($r$ = -.41), and perceived social competence ($r$ = -.32). Openness showed a modest significant positive association with scholastic competence ($r$ = .30) and was otherwise largely unrelated to self-concept domains.

**Table 3.**

*Random intercept correlations between stable components of personality and self-perception domains.*

| **Self-concept Domain** | **Agreeableness** | **Conscientiousness** | **Extraversion** | **Neuroticism** | **Openness** |
|---|---|---|---|---|---|
| Physical appearance | .87*** | .43** | .53** | -.37* | .10 |
| Athletic competence | .59** | .45*** | .52** | -.44** | -.06 |
| Behavioral conduct | .83*** | .50*** | .25 | -.19 | .29 |
| Close friendship | .70*** | .44*** | .45** | -.20 | .18 |

| | | | | | |
|---|---|---|---|---|---|
| competence | | | | | |
| Scholastic competence | .67** | .53*** | .24 | -.24 | .30* |
| Global self-worth | .99*** | .56*** | .49** | -.41* | .12 |
| Perceived social competence | .63** | .44*** | .57*** | -.32* | .10 |

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

**Table 4.**

*Standardized autoregressive (AR) and cross-lagged (CL) effects of personality predicting self-concept*

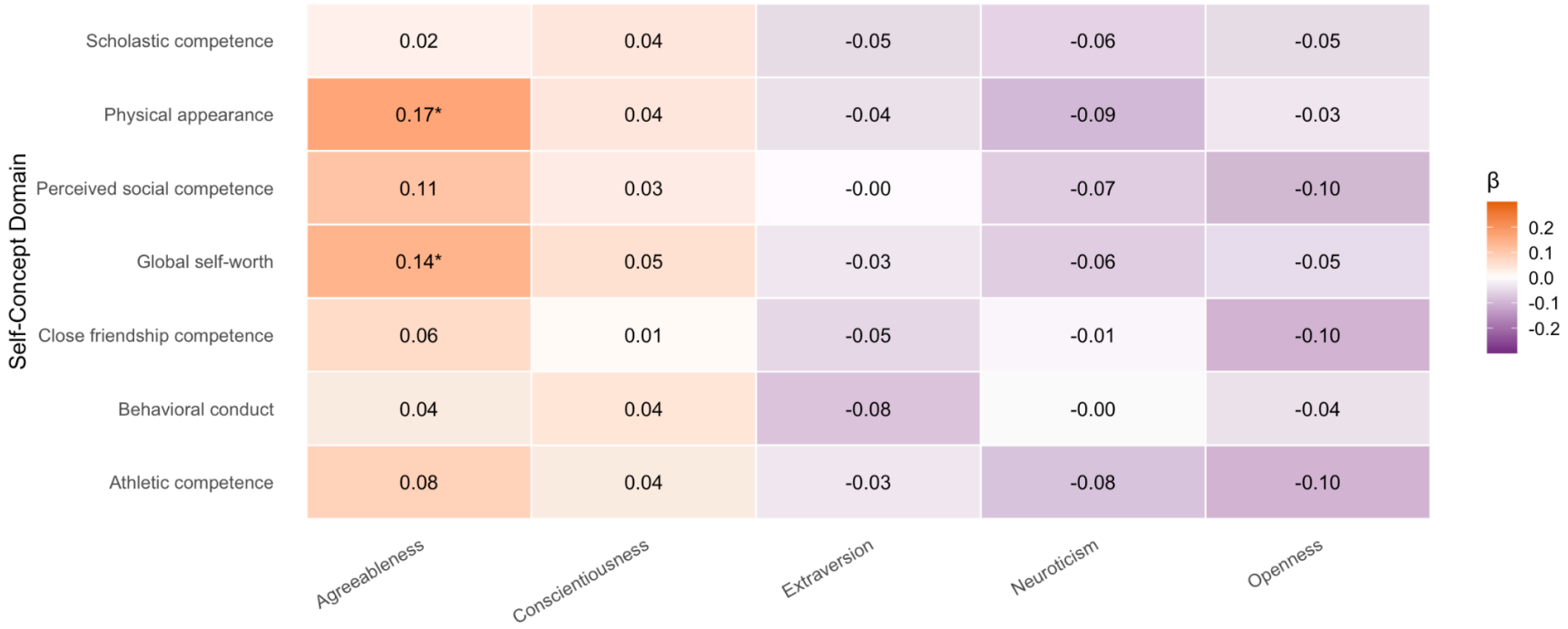
| | Auto-regressive (Trait to trait) | | | | Cross-lag (Trait to self-concept) | | | |
|---|---|---|---|---|---|---|---|---|
| **Trait** | **W1->W2** | **W2->W3** | **W3->W4** | **W4->W5** | **W1->W2** | **W2->W3** | **W3->W4** | **W4->W5** |
| **Athletic competence** | | | | | | | | |
| Agreeableness | .17 (.04)* | .18 (.04)* | .16 (.04)* | .17 (.04)* | .09 (.06) | .08 (.05) | .08 (.05) | .08 (.05) |
| Conscientiousness | .13 (.03)* | .13 (.04)* | .13 (.03)* | .14 (.04)* | .04 (.05) | .03 (.04) | .03 (.04) | .04 (.05) |
| Extraversion | .23 (.04)* | .21 (.03)* | .22 (.04)* | .26 (.05)* | -.04 (.06) | -.03 (.05) | -.03 (.04) | -.04 (.05) |
| Neuroticism | .15 (.03)* | .18 (.04)* | .16 (.04)* | .16 (.04)* | -.08 (.05) | -.08 (.05) | -.08 (.05) | -.09 (.06) |
| Openness | .15 (.03)* | .16 (.04)* | .16 (.04)* | .16 (.04)* | -.10 (.05) | -.09 (.05) | -.10 (.05) | -.11 (.06) |
| **Behavioral conduct** | | | | | | | | |
| Agreeableness | .17 (.03)* | .18 (.04)* | .16 (.03)* | .18 (.04)* | .04 (.06) | .04 (.06) | .03 (.05) | .04 (.06) |
| Conscientiousness | .14 (.03)* | .14 (.03)* | .13 (.03)* | .15 (.04)* | .04 (.05) | .04 (.04) | .04 (.04) | .05 (.05) |
| Extraversion | .23 (.04)* | .21 (.03)* | .22 (.04)* | .26 (.04)* | -.08 (.06) | -.07 (.05) | -.07 (.05) | -.08 (.06) |
| Neuroticism | .16 (.03)* | .19 (.04)* | .17 (.04)* | .17 (.04)* | .00 (.05) | .00 (.05) | .00 (.05) | .00 (.06) |
| Openness | .16 (.03)* | .17 (.04)* | .16 (.04)* | .16 (.04)* | -.03 (.05) | -.04 (.05) | -.04 (.05) | -.04 (.06) |
| **Close friendship competence** | | | | | | | | |
| Agreeableness | .16 (.03)* | .17 (.04)* | .15 (.04)* | .16 (.04)* | .07 (.06) | .06 (.05) | .06 (.05) | .06 (.05) |
| Conscientiousness | .12 (.03)* | .12 (.03)* | .12 (.03)* | .13 (.04)* | .01 (.05) | .01 (.04) | .01 (.04) | .01 (.05) |
| Extraversion | .22 (.04)* | .19 (.03)* | .20 (.04)* | .24 (.04)* | -.06 (.06) | -.05 (.05) | -.05 (.05) | -.06 (.06) |
| Neuroticism | .14 (.03)* | .17 (.04)* | .15 (.04)* | .15 (.04)* | -.01 (.05) | -.01 (.05) | -.01 (.05) | -.01 (.06) |
| Openness | .14 (.03)* | .15 (.04)* | .14 (.04)* | .14 (.04)* | -.10 (.05) | -.10 (.05) | -.10 (.05) | -.11 (.06) |
| **Global self-worth** | | | | | | | | |
| Agreeableness | .18 (.03)* | .19 (.04)* | .17 (.04)* | .20 (.04)* | .16 (.06)* | .14 (.05)* | .13 (.05)* | .14 (.05)* |
| Conscientiousness | .15 (.03)* | .15 (.03)* | .15 (.03)* | .16 (.04)* | .06 (.05) | .05 (.04) | .05 (.04) | .06 (.05) |
| Extraversion | .25 (.04)* | .23 (.03)* | .23 (.04)* | .28 (.05)* | -.03 (.06) | -.03 (.05) | -.02 (.04) | -.03 (.05) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Neuroticism | .17 (.03)* | .20 (.04)* | .19 (.04)* | .18 (.04)* | -.06 (.05) | -.06 (.05) | -.06 (.05) | -.07 (.05) |
| Openness | .17 (.03)* | .19 (.04)* | .18 (.04)* | .18 (.04)* | -.05 (.05) | -.04 (.05) | -.05 (.05) | -.05 (.05) |
| **Perceived social competence** | | | | | | | | |
| Agreeableness | .15 (.03)* | .17 (.04)* | .15 (.04)* | .16 (.04)* | .11 (.06) | .11 (.06) | .10 (.05) | .11 (.06) |
| Conscientiousness | .12 (.03)* | .12 (.03)* | .11 (.03)* | .13 (.04)* | .03 (.05) | .03 (.04) | .03 (.04) | .03 (.05) |
| Extraversion | .21 (.04)* | .19 (.03)* | .20 (.04)* | .23 (.04)* | .00 (.06) | .00 (.05) | .00 (.05) | .00 (.06) |
| Neuroticism | .14 (.03)* | .17 (.04)* | .15 (.04)* | .14 (.04)* | -.06 (.05) | -.07 (.05) | -.07 (.05) | -.07 (.06) |
| Openness | .14 (.03)* | .15 (.04)* | .15 (.04)* | .14 (.04)* | -.09 (.05) | -.09 (.05) | -.10 (.05) | -.11 (.06) |
| **Physical appearance** | | | | | | | | |
| Agreeableness | .21 (.04)* | .23 (.04)* | .20 (.04)* | .24 (.04)* | .21 (.06)* | .16 (.05)* | .15 (.04)* | .16 (.05)* |
| Conscientiousness | .18 (.04)* | .18 (.04)* | .18 (.04)* | .20 (.04)* | .05 (.05) | .04 (.04) | .04 (.04) | .04 (.05) |
| Extraversion | .28 (.04)* | .25 (.03)* | .27 (.04)* | .32 (.05)* | -.05 (.06) | -.04 (.04) | -.03 (.04) | -.04 (.05) |
| Neuroticism | .19 (.03)* | .23 (.04)* | .21 (.04)* | .21 (.04)* | -.10 (.06) | -.09 (.05) | -.09 (.05) | -.09 (.05) |
| Openness | .20 (.03)* | .22 (.04)* | .22 (.04)* | .22 (.04)* | -.04 (.06) | -.03 (.05) | -.03 (.05) | -.03 (.05) |
| **Scholastic competence** | | | | | | | | |
| Agreeableness | .19 (.04)* | .20 (.04)* | .18 (.04)* | .19 (.04)* | .03 (.06) | .02 (.05) | .02 (.05) | .02 (.06) |
| Conscientiousness | .14 (.03)* | .15 (.03)* | .14 (.03)* | .16 (.04)* | .04 (.05) | .04 (.04) | .04 (.04) | .05 (.05) |
| Extraversion | .25 (.04)* | .23 (.03)* | .23 (.04)* | .28 (.05)* | -.06 (.06) | -.04 (.05) | -.04 (.05) | -.05 (.06) |
| Neuroticism | .16 (.03)* | .20 (.04)* | .18 (.04)* | .18 (.04)* | -.05 (.05) | -.05 (.05) | -.06 (.05) | -.06 (.06) |
| Openness | .17 (.03)* | .18 (.04)* | .17 (.04)* | .17 (.04)* | -.05 (.05) | -.05 (.05) | -.05 (.05) | -.05 (.06) |

*Note:* Asterisks indicate significance after FDR correction within each trait–domain relationship.

**Figure 4.**

*Cross-lagged effects of personality predicting self-concept.*




*Note:* Values are averaged across wave transitions. * p < .05 after FDR correction.

**Table 5.**

*Standardized autoregressive (AR) and cross-lagged (CL) effects of self-concept predicting personality.*

| | Auto-regressive (Self-concept to self-concept) | | | | Cross-lag (Self-concept to trait) | | | |
|---|---|---|---|---|---|---|---|---|
| **Self-concept domain** | **W1->W2** | **W2->W3** | **W3->W4** | **W4->W5** | **W1->W2** | **W2->W3** | **W3->W4** | **W4->W5** |
| **Agreeableness** | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Athletic competence | .21 (.05)* | .16 (.04)* | .16 (.03)* | .19 (.04)* | 1.37e-03 (9.07e-04) | 1.30e-03 (8.69e-04) | 1.17e-03 (7.83e-04) | 1.41e-03 (9.56e-04) |
| Behavioral conduct | .19 (.04)* | .17 (.03)* | .16 (.03)* | .20 (.04)* | 6.07e-04 (9.30e-04) | 5.96e-04 (9.18e-04) | 5.31e-04 (8.18e-04) | 6.32e-04 (9.76e-04) |
| Close friendship competence | .18 (.04)* | .15 (.03)* | .15 (.03)* | .18 (.04)* | 7.43e-04 (6.37e-04) | 7.19e-04 (6.24e-04) | 6.54e-04 (5.66e-04) | 7.86e-04 (6.85e-04) |
| Global self-worth | .23 (.05)* | .18 (.04)* | .18 (.03)* | .20 (.04)* | 1.65e-03 (6.12e-04) | 1.66e-03 (6.40e-04) | 1.53e-03 (5.95e-04) | 1.81e-03 (7.14e-04) |
| Perceived social competence | .17 (.04)* | .15 (.03)* | .15 (.03)* | .18 (.04)* | 1.40e-03 (7.27e-04) | 1.37e-03 (7.27e-04) | 1.23e-03 (6.49e-04) | 1.49e-03 (7.98e-04) |
| Physical appearance | .29 (.05)* | .22 (.04)* | .21 (.04)* | .25 (.04)* | 1.53e-03 (4.76e-04) | 1.60e-03 (5.20e-04) | 1.50e-03 (4.90e-04) | 1.83e-03 (6.07e-04) |
| Scholastic competence | .22 (.05)* | .19 (.04)* | .18 (.03)* | .22 (.04)* | 4.69e-04 (1.11e-03) | 4.61e-04 (1.09e-03) | 4.13e-04 (9.80e-04) | 4.95e-04 (1.17e-03) |
| **Conscientiousness** | | | | | | | | |
| Athletic competence | .16 (.04)* | .12 (.03)* | .12 (.03)* | .14 (.04)* | 6.67e-04 (8.82e-04) | 6.27e-04 (8.32e-04) | 5.86e-04 (7.80e-04) | 6.69e-04 (8.93e-04) |
| Behavioral conduct | .15 (.04)* | .13 (.03)* | .13 (.03)* | .15 (.04)* | 8.35e-04 (8.95e-04) | 8.16e-04 (8.77e-04) | 7.43e-04 (8.05e-04) | 8.35e-04 (9.04e-04) |
| Close friendship competence | .13 (.04)* | .12 (.03)* | .11 (.03)* | .13 (.04)* | 1.19e-04 (6.11e-04) | 1.15e-04 (5.90e-04) | 1.08e-04 (5.55e-04) | 1.23e-04 (6.31e-04) |
| Global self-worth | .18 (.04)* | .15 (.03)* | .14 (.03)* | .16 (.04)* | 6.96e-04 (5.97e-04) | 6.89e-04 (5.95e-04) | 6.40e-04 (5.56e-04) | 7.11e-04 (6.19e-04) |
| Perceived social competence | .12 (.04)* | .11 (.03)* | .11 (.03)* | .13 (.04)* | 4.55e-04 (6.89e-04) | 4.39e-04 (6.66e-04) | 4.14e-04 (6.31e-04) | 4.71e-04 (7.19e-04) |
| Physical appearance | .23 (.05)* | .19 (.04)* | .18 (.04)* | .20 (.04)* | 4.41e-04 (4.73e-04) | 4.53e-04 (4.86e-04) | 4.31e-04 (4.65e-04) | 4.89e-04 (5.29e-04) |
| Scholastic | .17 (.04)* | .14 (.03)* | .14 (.03)* | .16 (.04)* | 9.51e-04 | 9.39e-04 | 8.59e-04 | 9.74e-04 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| competence | | | | | (1.07e-03) | (1.06e-03) | (9.78e-04) | (1.11e-03) |
| **Extraversion** | | | | | | | | |
| Athletic competence | .28 (.05)* | .22 (.04)* | .21 (.03)* | .26 (.05)* | -7.37e-04 (1.12e-03) | -7.06e-04 (1.07e-03) | -7.13e-04 (1.08e-03) | -8.58e-04 (1.30e-03) |
| Behavioral conduct | .25 (.04)* | .22 (.04)* | .21 (.03)* | .26 (.04)* | -1.67e-03 (1.16e-03) | -1.61e-03 (1.11e-03) | -1.61e-03 (1.12e-03) | -1.96e-03 (1.37e-03) |
| Close friendship competence | .24 (.04)* | .20 (.04)* | .20 (.03)* | .24 (.04)* | -8.32e-04 (8.08e-04) | -7.90e-04 (7.63e-04) | -8.11e-04 (7.88e-04) | -9.82e-04 (9.55e-04) |
| Global self-worth | .31 (.05)* | .25 (.04)* | .23 (.04)* | .27 (.04)* | -4.31e-04 (7.57e-04) | -4.29e-04 (7.52e-04) | -4.44e-04 (7.78e-04) | -5.19e-04 (9.12e-04) |
| Perceived social competence | .23 (.04)* | .20 (.04)* | .20 (.03)* | .24 (.05)* | -1.29e-05 (9.18e-04) | -1.25e-05 (8.85e-04) | -1.26e-05 (8.94e-04) | -1.51e-05 (1.07e-03) |
| Physical appearance | .37 (.05)* | .29 (.04)* | .27 (.04)* | .31 (.04)* | -4.66e-04 (5.82e-04) | -4.90e-04 (6.14e-04) | -5.15e-04 (6.43e-04) | -6.09e-04 (7.61e-04) |
| Scholastic competence | .29 (.05)* | .24 (.04)* | .23 (.03)* | .28 (.05)* | -1.30e-03 (1.36e-03) | -1.28e-03 (1.34e-03) | -1.28e-03 (1.35e-03) | -1.56e-03 (1.64e-03) |
| **Neuroticism** | | | | | | | | |
| Athletic competence | .19 (.04)* | .15 (.03)* | .15 (.03)* | .18 (.04)* | -2.08e-03 (1.36e-03) | -2.07e-03 (1.36e-03) | -1.69e-03 (1.12e-03) | -1.88e-03 (1.25e-03) |
| Behavioral conduct | .18 (.04)* | .16 (.03)* | .15 (.03)* | .19 (.04)* | -9.55e-05 (1.37e-03) | -9.72e-05 (1.40e-03) | -7.81e-05 (1.12e-03) | -8.58e-05 (1.23e-03) |
| Close friendship competence | .16 (.04)* | .14 (.03)* | .14 (.03)* | .17 (.04)* | -2.20e-04 (9.43e-04) | -2.20e-04 (9.46e-04) | -1.82e-04 (7.83e-04) | -2.01e-04 (8.61e-04) |
| Global self-worth | .22 (.04)* | .17 (.03)* | .17 (.03)* | .20 (.04)* | -1.12e-03 (9.27e-04) | -1.17e-03 (9.70e-04) | -9.70e-04 (8.09e-04) | -1.02e-03 (8.49e-04) |
| Perceived social competence | .15 (.04)* | .14 (.03)* | .14 (.03)* | .16 (.04)* | -1.37e-03 (1.07e-03) | -1.39e-03 (1.09e-03) | -1.14e-03 (8.99e-04) | -1.25e-03 (9.83e-04) |
| Physical | .27 (.05)* | .21 (.04)* | .20 (.04)* | .23 (.04)* | -1.30e-03 | -1.40e-03 | -1.19e-03 | -1.28e-03 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| appearance | | | | | (7.34e-04) | (7.99e-04) | (6.83e-04) | (7.32e-04) |
| Scholastic competence | .20 (.04)* | .17 (.03)* | .16 (.03)* | .20 (.04)* | -1.74e-03 (1.64e-03) | -1.80e-03 (1.70e-03) | -1.45e-03 (1.38e-03) | -1.59e-03 (1.51e-03) |
| **Openness** | | | | | | | | |
| Athletic competence | .18 (.04)* | .14 (.03)* | .15 (.03)* | .17 (.04)* | -2.12e-03 (1.10e-03) | -2.00e-03 (1.05e-03) | -1.77e-03 (9.33e-04) | -1.92e-03 (1.01e-03) |
| Behavioral conduct | .17 (.04)* | .15 (.03)* | .15 (.03)* | .18 (.04)* | -7.92e-04 (1.11e-03) | -7.66e-04 (1.07e-03) | -6.56e-04 (9.16e-04) | -7.11e-04 (9.91e-04) |
| Close friendship competence | .15 (.04)* | .13 (.03)* | .13 (.03)* | .15 (.04)* | -1.50e-03 (7.66e-04) | -1.44e-03 (7.40e-04) | -1.26e-03 (6.51e-04) | -1.37e-03 (7.07e-04) |
| Global self-worth | .21 (.05)* | .17 (.04)* | .17 (.03)* | .19 (.04)* | -6.72e-04 (7.35e-04) | -6.68e-04 (7.31e-04) | -5.86e-04 (6.43e-04) | -6.24e-04 (6.84e-04) |
| Perceived social competence | .15 (.04)* | .13 (.03)* | .14 (.03)* | .16 (.04)* | -1.58e-03 (8.57e-04) | -1.52e-03 (8.30e-04) | -1.35e-03 (7.39e-04) | -1.47e-03 (8.05e-04) |
| Physical appearance | .27 (.05)* | .21 (.04)* | .20 (.04)* | .23 (.04)* | -3.76e-04 (5.80e-04) | -3.95e-04 (6.09e-04) | -3.51e-04 (5.42e-04) | -3.79e-04 (5.85e-04) |
| Scholastic competence | .19 (.04)* | .16 (.04)* | .16 (.03)* | .19 (.04)* | -1.21e-03 (1.32e-03) | -1.19e-03 (1.30e-03) | -1.02e-03 (1.11e-03) | -1.11e-03 (1.22e-03) |

*Note:* Asterisks indicate significance after FDR correction within each trait–domain relationship.

† Autoregressive effect size for physical appearance and global self-worth rounds to .000 at three decimal places but is statistically significant after FDR correction.

For each self-concept domain, I report a) cross-lagged effects of personality predicting subsequent self-concept and b) cross-lagged effects of self-concept predicting subsequent personality.

*Physical appearance*

Agreeableness consistently and significantly predicted physical appearance self-concept across all four wave transitions, such that higher agreeableness was associated with higher physical appearance self-concept at the following wave (Table 4). Cross-lagged effects involving conscientiousness, extraversion, neuroticism, and openness were small and non-significant.

No cross-lagged paths from physical appearance self-concept to any personality trait were significant at any wave (Table 5), indicating that within-person fluctuations in appearance self-concept did not predict subsequent changes in personality.

*Scholastic competence*

No personality trait significantly predicted scholastic competence across wave transitions after FDR correction (Table 4). Cross-lagged paths from scholastic competence to all five personality traits were similarly non-significant across all waves (Table 5).

*Perceived social competence*

No personality trait significantly predicted perceived social competence across wave transitions after FDR correction (Table 4). Cross-lagged paths from perceived social competence to all five personality traits were similarly non-significant across all waves (Table 5).

*Athletic competence*

No personality trait significantly predicted athletic competence across wave transitions after FDR correction (Table 4). Cross-lagged paths from perceived athletic competence to all five personality traits were similarly non-significant across all waves (Table 5).

*Behavioral conduct*

No significant effects were observed for cross-lagged paths from agreeableness, conscientiousness, extraversion, neuroticism, or openness to behavioral conduct (Table 4). Cross-lagged paths from behavioral conduct to all personality traits were non-significant across all waves (Table 5).

*Close friendship competence*

No significant effects were observed for cross-lagged paths from agreeableness, conscientiousness, extraversion, neuroticism, or openness to close friendship competence (Table 4). No cross-lagged effects from close friendship competence to any personality trait were significant across waves (Table 5).

*Global self-worth*

Agreeableness consistently and significantly predicted global self-worth across all wave transitions, such that higher agreeableness was associated with higher global self-worth at the subsequent wave (Table 4). Cross-lagged effects involving other personality traits were non-significant. Cross-lagged paths from global self-worth to all personality traits were small and largely non-significant across waves (Table 5).

## Discussion

The present study set out to examine longitudinal associations between adolescents' domain-specific self-perception and personality traits across five waves, using random intercept cross-lagged panel models to separate between-person differences from dynamic within-person change. Of the seven SPPA subscales examined, only two – physical appearance and athletic competence – demonstrated the measurement invariance necessary to support meaningful longitudinal comparison. Among these, only one yielded a significant within-person cross-lagged

effect – agreeableness consistently predicted higher subsequent physical appearance self-concept across all four wave transitions. Because meaningful interpretation of cross-lagged associations and random intercept correlations requires that constructs are measured equivalently at each wave, measurement invariance is a necessary precondition for the RI-CLPM analyses originally planned. Given that five of the seven subscales failed to meet criteria for metric invariance, I focus the present discussion on what these patterns of invariance and noninvariance reveal about the developmental stability of adolescent self-concept, rather than proceeding to cross-lagged modeling that would rest on unsupported measurement foundation (Putnick & Bornstein, 2016; Van De Schoot et al., 2015). The cross-lagged results for the noninvariant subscales are reported in the results section for transparency, but as noted there, they should not be substantively interpreted.

**Examining empirical factor structure**

Before turning to measurement invariance, it is worth noting that the empirically derived factor structure did not perfectly replicate the theoretical structure proposed by Harter (2012b). Although a seven-factor solution was selected and its factors corresponded broadly to the original seven subscales (not including job competence and romantic competence), several items behaved differently than their assigned subscale membership would predict. Item 13, "Some people are often disappointed with themselves", loaded onto the physical appearance factor rather than global self-worth. Inspecting its content suggests that the items wording is ambiguous enough to be interpreted as dissatisfaction or disappointment with one's body or looks, particularly among adolescent girls for whom appearance is a salient domain of self-evaluation (Lawler & Nixon, 2011; Neumark-Sztainer et al., 2006; Rodgers et al., 2014). Item 69, "Some people are very happy being the way they are", showed a similar pattern, cross-loading onto both

physical appearance and global self-worth likely because “the way they are” carries no domain-specific anchor and adolescents may resolve this ambiguity in different directions. Item 39, “Some people do know what it takes to develop a close friendship with a peer”, cross loaded onto both close friendship competence and perceived social competence, a finding that makes sense theoretically given that knowing how to cultivate a close friendship overlaps meaningfully with the broader social skill set captured by the social competence subscale. Finally, Item 1, “Some people feel that they are just as smart as others their age”, failed to meet the .40 loading threshold on any factor, suggesting that in this sample it did not cohere strongly with the remaining scholastic competence items.

These deviations from the theoretical structure are notable for several reasons. The cross-loadings and misassignments cluster around items that do not clearly anchor the respondent to a specific behavioral or evaluative domain. Item 13’s reference to disappointment with oneself and Item 69’s reference to being happy “the way they are” share this quality of ambiguity, leaving their interpretation open in a way that more behaviorally concrete items do not. The present EFA thus offers an early signal, at the level of factor structure rather than longitudinal stability, that the SPPA’s theoretical organization is not fully recoverable from the data, and that some items may be doing something different than their subscale assignment implies.

**The role of concrete referents**

Two subscales, physical appearance and athletic competence, demonstrated full scalar invariance across all five waves, with changes in all fit indices falling well below conventional thresholds ($\Delta CFI \leq .009$; $\Delta RMSEA \leq .002$; Cheung & Rensvold, 2002). This finding converges with longitudinal evidence of large and robust rank-order stability in both physical appearance and athletic competence across adolescence (Putnick et al., 2020). That both the equivalence of

the measurement model and the consistency of individual differences point in the same direction for these two domains suggests stability in how physical appearance and athletic competence are psychologically organized and expressed across development.

Physical appearance self-concept may be anchored to relatively concrete, observable referents – how one's body looks, how one compares to peers physically – that are evaluated in a consistent way, even as their social salience changes across adolescence (Harter, 2012b). Athletic competence shows a similar pattern, likely because both domains are assessed with reference to stable behavioral and performance-based referents that maintain consistent psychological meaning across the adolescent years (Marsh et al., 2018). The concrete nature of these two domains may be precisely what insulates them from the kind of developmental drift in item meaning that undermines measurement stability elsewhere in the questionnaire. This interpretation is consistent with findings from cross-sectional measurement invariance research suggesting that self-concept domains tied to observable behaviors and physical characteristics tend to show more stable psychometric properties across groups than those defined by more abstract or socially contingent judgements (Wichstrøm, 1995).

**Noninvariance as developmental signal**

The remaining five subscales tell a different story, and their noninvariance is most productively understood as a substantive developmental signal rather than a purely methodological failure (Millsap & Kwok, 2004). The present findings can be read as the direct empirical consequence of holding a fixed instrument across a developmental span during which the psychological content of several self-concept domains is itself shifting. When item meaning evolves but items do not, the result is measurement noninvariance.

Importantly, the present study assessed participants every 1.5-2 years, considerably shorter intervals than those used in many longitudinal self-concept studies. Shorter intervals should, in principle, make invariance easier to achieve because less developmental change accumulates between any two adjacent waves, though the five-wave design also increases statistical power to detect subtle violations that sparser designs might miss. The fact that metric noninvariance nonetheless emerged across these relatively brief intervals for five of seven subscales suggests that measurement instability observed here is not simply a function of how much time passes between assessments, but reflects something more fundamental about the pace of psychological change during adolescence itself. Even modest developmental transitions appear sufficient to destabilize the measurement model for socially and contextually sensitive self-concept domains. It is also worth distinguishing between two sources of noninvariance that the present design cannot fully separate – instability from one wave to the next, and systematic differences across the age range the study spans. Wave 1 participants were 10-13 years old, meaning that even adjacent wave comparisons may cross developmentally consequential boundaries. The transition from early to middle adolescence, for instance, involves substantial shifts in peer orientation, social cognition, and identity processing that could alter how self-concept items are interpreted regardless of how little calendar time has elapsed. The 1.5-2 year interval between waves does not insulate the comparisons from this kind of age-graded change if development itself is moving quickly. The present data do contain age variation that could in principle support cohort-based analyses, since participants entered the study between ages 10 and 13 and were followed across five waves, creating overlapping age coverage across the sample. However, the sample size within any given age band is likely too small to support the kind of robust cohort comparisons that would be needed to cleanly separate age-graded and

wave-based sources of noninvariance. Future work with larger samples spanning a similar age range could leverage this kind of within-study age variation more formally, using accelerated longitudinal approaches to estimate whether measurement instability is concentrated around particular developmental transitions or distributed more evenly across adolescence.

For perceived social competence, what constitutes social skill and peer acceptance shifts substantially across adolescence, from navigating early peer group dynamics and gaining acceptance at younger ages, to managing romantic relationships, social identity, and autonomous functioning in later adolescence (Brown, 2004; Steinberg & Morris, 2001). Items that assess social competence cannot fully accommodate this shift in referent, and the result is instability in factor loadings across waves. A similar logic applies to behavioral conduct. The standards against which adolescents evaluate their own behavior shift from externally imposed parental and school-based rules in early adolescence toward more internalized and peer-referenced moral standards by late adolescence (Kohlberg & Hersh, 1977; Smetana et al., 2015). Items assessing behavioral conduct may therefore be interpreted through meaningfully different normative frames at different waves, altering their relationship to the underlying latent construct.

Close friendship competence showed borderline metric invariance, and scholastic competence showed acceptable configural fit before failing at the metric stage, pointing to instability in factor loadings without implying that the basic factor structure is wrong. Both findings are consistent with the developmental literature. Friendships become more intimate, reciprocal, and emotionally central across adolescence (Berndt, 2002; Furman & Buhrmester, 1992), shifting what friendship competence means to adolescents at different ages. Academic self-concept becomes increasingly consequential and identity-defining as educational decisions with long-term implications become salient in later adolescence (Eccles et al., 1993; Wigfield &

Eccles, 2000), which may alter how items about scholastic ability are interpreted and weighted at different developmental stages.

The failure of metric invariance for global self-worth is particularly consequential given how central this construct is to developmental research (Orth & Robins, 2014; Robins & Trzesniewski, 2005). Global self-worth, as operationalized in the SPPA, is not a composite of domain-specific evaluations but rather an independent judgement about how much one likes oneself as a person overall, scored separately from any domain subscale and not derivable from them (Harter, 2012b). What this overall sense of personal worth means to an adolescent, and what experiences and standards inform it, may nonetheless shift considerably across development – from concerns centered on peer acceptance and belonging in early adolescence, toward questions of autonomy, romantic relationships, and emerging adult roles in later adolescence (Erikson, 1968; Klimstra, 2013). If the psychological references that anchor this global judgement shifts in this way, the items capturing it may function differently across developmental time, even when the construct label remains unchanged. Notably, global self-worth showed the poorest measurement properties of any subscale in the battery, which stands in some tension with its theoretical proximity to physical appearance, a subscale that achieved full scalar invariance. This dissociation suggests that while both constructs may be similarly predicted by other variables at the between-person level, they behave very differently as measured constructs across development. The abstract, evaluative character of global self-worth – a judgement about one's overall value as a person rather than competence in any specific, observable domain – makes it particularly vulnerable to developmental shifts in the standards and referents adolescents bring to that judgement, in a way that the more concrete items of physical appearance do not.

**Stability vs invariance**

The noninvariance of social competence in particular sits in apparent tension with evidence of large rank-order stability in social competence across adolescence (Putnick et al., 2020). This tension illuminates an important conceptual distinction. Rank-order stability – the degree to which individuals maintain their relative standing within a group over time (Bornstein et al., 2017; Caspi & Roberts, 2001) – and measurement invariance – the degree to which a fixed set of items captures the same latent construct equivalently across time (Van De Schoot et al., 2015) – are related but distinct properties. A construct can show high rank-order stability even when the measurement model is noninvariant because individuals may consistently differ from one another on whatever the items are capturing at each wave, even if what the items capture are themselves shifting. Essentially, adolescents who perceive themselves as more socially competent than their peers in early adolescence may continue to perceive themselves as relatively more socially competent in late adolescence, even if what "social competence" means, and therefore what the items are measuring, has changed substantially in the intervening years. Further, rank-order stability estimates are attenuated by longer intervals, a limitation that annually-collected stability coefficients have been used to address (Putnick et al., 2020), whereas measurement invariance violations may actually be easier to detect with shorter intervals and more measurement occasions, as in the present design. Rank-order stability and measurement equivalence therefore address different questions using different methodological log, and evidence of one does not imply the other. Together, these two forms of evidence are complementary rather than contradictory, and underscore why both are valuable to fully characterize the developmental properties of self-concept measures.

**Implications for longitudinal research using the SPPA**

Taken together, these findings suggest that the SPPA is not a uniform instrument across the span of adolescence. Its subscales differ meaningfully in their developmental stability, and that variation maps onto a theoretically coherent distinction. Domains defined by concrete, observable, and relatively stable referents hold up across time, while domains whose psychological content is tied to shifting developmental tasks and social contexts do not. This pattern is consistent with broader arguments in the developmental measurement literature that the validity of longitudinal comparisons cannot be assumed simply because the same instrument is administered at each wave (Little, 2024; Putnick & Bornstein, 2016). The present findings also suggest that routine measurement invariance testing should be a standard step in longitudinal self-concept research. This is particularly important for studies spanning a wide range of adolescence, given that even relatively short developmental intervals appear sufficient to produce meaningful shifts in how self-concept items are understood and endorsed.

For researchers using the SPPA in longitudinal designs, this distinction matters practically. Latent variable analyses, including comparisons of factor associations and cross-lagged paths, involving physical appearance and athletic competence can proceed with confidence given their demonstrated scalar invariance. For subscales showing borderline or partial metric invariance, such as close friendship competence and scholastic competence, observed score approaches with appropriate caveats or partial invariance modeling that identifies and frees the specific parameters driving noninvariance may allow for cautious interpretation (Vandenberg & Lance, 2000). For subscales showing clear metric noninvariance, such as perceived social competence, global self-worth, and behavioral conduct, latent variable comparisons across time are not defensible, and observed score approaches should be

accompanied by explicit acknowledgement that the construct being measured is not equivalent across waves rather than treated as a minor limitation.

**Future work**

Future instrument development efforts might consider whether developmentally calibrated item content could improve longitudinal measurement equivalence for contextually sensitive self-concept domains. Using age-appropriate instruments that allow item content to shift with development is one avenue worth exploring, though prior work suggests this approach does not fully resolve the problem (Putnick et al., 2020). Even when age-appropriate versions of scales are used across adolescence, with constructs held largely consistent but item content allowed to evolve, stability in socially contingent domains like social competence remains more limited than in concrete domains like physical appearance and athletic competence, and the tension between measurement fidelity and construct change persists (Putnick et al., 2020). This suggests that the instability documented here is not simply a consequence of holding items fixed, but reflects genuine developmental flux in the psychological content of these domains that any fixed measurement strategy will struggle to fully accommodate. Developing instruments that are simultaneously sensitive to developmental change and capable of supporting longitudinal comparisons therefore remains an open challenge for the field.

A particularly valuable direction for future instrument development would be to directly examine how adolescents interpret SPPA items at different developmental stages, rather than inferring construct shift from model fit statistics alone. Cognitive interviewing methods, including think-aloud protocols in which participants verbalize their reasoning as they respond to items, have been used productively in survey methodology to identify ambiguous or developmentally inappropriate item content (Wolcott & Lobczowski, 2021). Applied to the

SPPA, such methods could reveal whether adolescents at different ages are drawing on different referents, comparison targets, or evaluative standards when responding to the same item, for instance, whether "knowing how to make friends" is interpreted in terms of playground dynamics at age 11 but identity-based social contexts at age 17. This kind of direct evidence about item interpretation would complement the statistical signal from measurement invariance analyses and provide actionable guidance for targeted item revision or age-specific wording. Qualitative approaches, including semi-structured interviews about self-concept in specific domains, could further illuminate the psychological content adolescents associate with each domain at different developmental stages, helping researchers determine whether construct shift is gradual or concentrated around particular developmental transitions (Harter, 2012a).

A complementary instrument development strategy worth exploring is the use of anchoring vignettes – brief, standardized descriptions of hypothetical individuals that respondents rate before rating themselves – as a means of calibrating self-report scales across groups or time points (King & Wand, 2007; Primi et al., 2016). Originally developed to address cross-cultural differential item functioning in survey research, anchoring vignettes work by providing a shared external referent against which self-ratings can be rescaled, thereby separating differences in the underlying construct from differences in how respondents use the response scale. Applied to developmental research, this approach could help disentangle genuine change in self-concept from shifts in the internal standards adolescents use when evaluating themselves, particularly in domains like social competence and global self-worth, where the normative referents for self-evaluation shift substantially across adolescence. Vignette-based calibration offers a practical path toward improving longitudinal measurement equivalence without requiring the development of entirely new instruments.

The broader implication is that the developmental sensitivity that makes adolescent self-concept a compelling research target is the same feature that makes it difficult to measure equivalently across time. What adolescents mean when they evaluate their social competence, their behavioral conduct, or their global worth as a person is not fixed but evolves alongside the developmental tasks, social roles, and identity processes that define adolescence as a period (Erikson, 1968; Harter, 2012a; Klimstra, 2013). The present findings, emerging across relatively short assessment intervals, suggest that this evolution is rapid enough that even a 1.5 to 2 year window can be sufficient to shift the measurement properties of contextually sensitive self-concept domains. Longitudinal measurement practices in this area have not yet fully reckoned with this tension, and the present findings suggest that attending to it carefully, through routine invariance testing, partial invariance modeling, and developmentally sensitive construction, will be essential for the field moving forward.

# CHAPTER 5 - GENERAL OVERVIEW AND DISCUSSION

Maia, the adolescent introduced at the outset of this dissertation, navigates her world through perception – of herself, of her friendships, of her parents, and of how these overlap or diverge. She feels rejected on Tuesday and understood on Wednesday, and her mood shifts accordingly. She sees herself as responsible but her mother sees her as someone who still needs reminders. She believes she is reasonably smart but worries about her appearance, and over the years, these self-views have slowly shifted in ways she can't fully explain. Maia's experience is not unusual.

In this dissertation I have examined three distinct aspects of that experience: how specific daily friendship interactions shape emotional well-being in real time (Study 1); how parents and adolescents agree (or disagree) on perceptions of parenting behaviors across development (Study 2); and how the measurement of adolescents' domain-specific self-perceptions holds up – or fails – across the span of adolescence (Study 3). Together these studies suggest that perception does more than just mirror adolescent experience and that it actively shapes how development unfolds. The studies make this case across three relationship contexts – friendship, the parent-child dyad, and the self.

## Integrative summary

The key takeaway from this dissertation is that perception in adolescence is not simply a reflection of experience but an active part of how development unfolds. A consistent pattern emerged across the three studies spanning daily friendship dynamics, longitudinal parent-child agreement, and the measurement of self-concept across adolescence. The specific ways adolescents perceive their relational worlds matter for their emotional well-being and development, and those effects are not well captured by broad or aggregated measures. Feeling

rejected on a given day carries distinct emotional consequences that feeling generally unsupported does not. Agreement about parenting behaviors between parents and adolescents varies meaningfully across domains and family dyads in ways that are theoretically informative rather than merely methodologically inconvenient. And the self-perceptions adolescents hold across different domains of their lives cannot be assumed to mean the same thing at age 11 as at age 17, a finding with fundamental implications for how longitudinal self-concept research is conducted and interpreted. Taken together, these studies make the case that understanding adolescent development requires understanding not just what happens to young people, but also how they perceive, interpret, and carry forward those experiences. The specificity of that process – which friendship experience, which parenting domain, which self-concept, at which moment – is not noise to be averaged away but where meaningful signal tends to be.

## Summary of results and implications

The goal of my dissertation was to examine perceptual processes in adolescent close relationships – how adolescents perceive their daily friendship experiences, how parents and adolescents perceive parenting behavior, and how adolescents perceive themselves across specific domains – and what these perceptual processes mean for emotional well-being and personality development. Across all three studies, a consistent picture emerged in which perception is not a passive reflection of adolescent experience but an active process through which development unfolds, and that process is organized at a level of specificity that broad, aggregated measures have not been created to capture.

Study 1 demonstrated that specific daily friendship experiences carried distinct affective consequences that could not be recovered from a composite measure of friendship quality. Feeling more supported and valued than usual predicted lower depressed affect, while feeling

more secure than usual did not. Feeling more rejected than usual predicted both elevated depressed affect and diminished happiness, spanning negative and positive affect domains simultaneously, while jealousy showed a narrower profile. Feeling more supported, secure, trusted, valued, and understood than usual were most consistently linked to happiness, joy, and self-confidence. Conversely feeling rejected, lonely, jealous, and stressed, despite being relatively rare, showed broader and more consistent affective consequences, a pattern consistent with the theory that negative events exert disproportionate influence on emotional functioning (Baumeister et al., 2001; Schwartz-Mette et al., 2020b). In a supplementary analysis among the subset of participants in romantic relationships, friendship effects were largely attenuated when romantic relationship experiences were included as a covariate, while a small number of interaction terms suggested that the two relational contexts can moderate one another's associations with affect. These findings should be interpreted cautiously given the limited statistical power of this subsample, but they raise important questions about how friendship and romantic relationships jointly and separately shape adolescents' daily emotional lives. These are questions that remain an important area for future work.

Study 2 shifted focus from daily dynamics to developmental trajectories, examining whether parents and adolescents in Mexican-origin families agreed on perceptions of parenting behavior from middle childhood through late adolescence. Overall, parent-child agreement was moderate but highly variable across families, parenting domains, gender dyads, and informant types. Agreement was stronger for hostility and relationship quality than for warmth and monitoring, stronger in mother-daughter than father-son dyads, and stronger when parents rated their spouse's behavior than their own. Contrary to some prior work suggesting that agreement declines across adolescence (Rajmil et al., 2013; Safford et al., 2005), agreement increased

modestly from ages 10 to 16, particularly in father-child dyads. Together, these findings suggest that discrepancies in parent-child perception are not uniformly negative or indicative of relational dysfunction but are a heterogeneous and developmentally patterned feature of family life.

Study 3 set out to examine longitudinal associations between adolescents' domain-specific self-perceptions and Big Five personality traits across five waves, using random intercept cross-lagged panel models to separate stable between-person differences from dynamic within-person change. A necessary prerequisite for those analyses was establishing that the SPPA measured the same constructs equivalently across developmental time. Rather than proceeding directly to substantive modeling, the study was redirected by what the measurement invariance analyses revealed. Whether the SPPA captures the same constructs in the same way across adolescence is not a question with one answer but varies meaningfully depending on which domain of self-concept is being assessed. Physical appearance and athletic competence demonstrated full scalar invariance, with factor loadings and item intercepts remaining stables across all five waves. These two domains share an important feature in that their self-evaluations are anchored to relatively concrete, observable referents – how one's body looks, how one performs physically – that retain consistent psychological meaning even as social salience shifts across adolescence. The remaining five subscales, scholastic competence, close friendship competence, perceived social competence, global self-worth, and behavioral conduct, all failed to meet criteria for metric invariance, meaning that factor loadings relating items to their underlying constructs shifted across waves. This pattern of noninvariance is most productively read not as a methodological failure but as a substantive developmental signal. The psychological content of these domains is itself changing across adolescence, and a fixed measurement instrument cannot fully accommodate that change. What it means to feel socially

competent, to evaluate one's behavioral conduct, or to appraise one's overall worth as a person is not stable from age 10 to 17 and the social contexts, normative referents, and developmental tasks that anchor these judgements are themselves in flux. The failure of global self-worth to achieve invariance is particularly consequential given its centrality to developmental research, and underscores that even constructs assumed to reflect a relatively timeless self-evaluative process are not immune to the developmental shifts that characterize adolescence.

Across all three studies, a methodological contribution worth noting is the consistent use of within-person designs and analytic approaches that separate stable individual differences from dynamic change. Study 1 used multilevel modeling with lagged affect controls to isolate daily within-person fluctuations. Study 2 used multilevel models to examine parent-child agreement and its moderators. Study 3 used measurement invariance testing to evaluate whether the SPPA captures equivalent constructs across developmental time – a prerequisite for any substantive longitudinal comparison that the field has largely bypassed. This convergence on within-person methodology reflects a shared theoretical commitment that the processes most consequential for adolescent development are not captured by stable averages alone, but by dynamic fluctuations around those averages and the ways those fluctuations accumulate into developmental change over time.

## Limitations and future directions

One limitation concerns the mechanisms linking perceptual processes to developmental outcomes. Across all three studies, these mechanisms are theoretically motivated but not directly assessed. Study 1 cannot determine whether the emotional consequences of feeling rejected operate through rumination, physiological arousal, or future social withdrawal. Study 2 identifies variation in parent-child agreement across domains and gender dyads but cannot test whether

cultural values such as *familismo* or *respeto*, adolescent disclosure practices, or communication quality account for those patterns, because none of these were measured directly. Study 3 proposes that within-person elevations in agreeableness and extraversion increase social exposure and generate recalibrating feedback, but does not measure social behavior, feedback-seeking, or the evaluative experiences that are theorized to update self-perceptions. In each case, the studies establish the what with reasonable rigor, while leaving the how as an inference rather than a finding.

A second limitation concerns the single-friendship focus of Study 1 and the single-relationship focus more broadly across the dissertation. Study 1 tracked adolescents' experiences in their one closest friendship, which is theoretically central during adolescence but excludes the broader peer context such as group dynamics, social hierarchies, and the influence of other friends whose daily interactions may also shape affect. Similarly, the dissertation examines friendships and parent-child relationships as largely separate contexts, with only a preliminary and underpowered examination of how romantic relationships interact with friendship effects in Study 1. How these multiple relational contexts operate simultaneously, whether positive experiences in one buffer against strain in another, and how their relative influences shift across adolescence, remain important open questions.

These limitations point toward several directions for future research. One priority is directly measuring the mechanisms that link perception to developmental outcomes. Across all three studies, the theoretical pathways were motivated but not tested. Future work that includes assessments of rumination, social behavior, disclosure practices, or feedback-seeking would move the field from establishing that perceptual processes matter to understanding how and why they carry the consequences they do.

A second future direction concerns timescale. Study 1 captured perception at the daily level while Study 3 assessed change across intervals of roughly 1.5 to 2 years. Neither design could observe the intermediate processes that may connect them. Daily fluctuations in friendship experiences, self-perceptions, or felt understanding from parents may gradually accumulate into the trait-level changes that longer-interval designs detect, but this accumulation process remains untested. Designs that combine intensive longitudinal measurement with extended follow-up periods would be ideal for tracing how short-term perceptual dynamics compound into longer-term developmental change.

A third future direction concerns the simultaneous study of multiple relational contexts. My dissertation examined friendship, parent-child relationships, and the self in parallel rather than together, and the one attempt to examine relational contexts jointly in Study 1 was limited by statistical power. Adolescents do not experience these contexts in isolation. Future work could examine whether feeling misunderstood by a parent shapes the emotional consequences of daily friendship experiences, or whether negative self-perceptions spill over into relational perceptions more broadly – for instance, whether adolescents who hold more negative views of themselves across domains also tend to feel more misunderstood or less supported in their close relationships on average.

## Conclusion

Across three studies spanning daily diary methodology, longitudinal multi-informant survey design, and longitudinal self-report survey design, this dissertation examined perceptual processes in adolescent close relationships from complementary angles and timescales. The findings collectively support a view of adolescent perception not as a passive mirror of experience but as an active, domain-specific, and developmentally patterned process through

which relational experiences shape emotional well-being and personality development. Specific daily friendship experiences carried distinct emotional signatures that composite measures would have obscured. Parent-child agreement in perceptions of parenting varied meaningfully across domains, gender dyads, and informant types in ways that are theoretically informative. And within-person fluctuations in agreeableness predicted subsequent shifts in domain-specific self-evaluations, while self-perceptions showed limited evidence of driving personality change over time. Together, these results advance developmental theory by underscoring the importance of specificity, within-person dynamics, and multi-timescale approaches for understanding how adolescents perceive themselves and their close relationships. They also carry practical implications for educators, clinicians, and caregivers, suggesting that domain-specific and day-to-day variation in relational experiences may be more informative than broad assessments of relationship quality or global self-esteem alone. Perception in adolescence is not noise to be controlled but a meaningful process through which development unfolds.

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