Developmental cascades from maternal depressive symptoms in childhood to adolescents' friendship quality: A 13-year longitudinal study

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Abstract

Adolescent friendships of positive quality promote well-being for decades to come. But what impedes the development of positive friendship quality? The current study examined whether maternal depressive symptoms during early childhood predict children's friendship quality into adolescence, and whether observed negative parenting behavior and children's earlier friendship quality, social skills, and their own depressive symptoms in middle childhood mediate these associations. We used six waves of data from a prospective-longitudinal community sample (N = 396). The study followed children and their mothers across 13 years from child ages 2–15 years (52% female, 67% White, 26% Black), collecting multi-informant data (from mothers, children, teachers, and behavioral observations). The significance of indirect effects was estimated with structural equation modeling. Exposure to high levels of maternal depressive symptoms in early childhood (child ages 2-5 years) was negatively correlated with children's later adolescent friendship quality (at age 15). Structural equation models revealed that this association was mediated by children's poorer social skills (age 7) and friendship quality (age 10). Negative parenting behavior and children's depressive symptoms did not mediate this association. Maternal depressive symptoms have downstream associations with children's friendship quality into adolescence, including via children's social skills. Promoting the social skills of children exposed to maternal depressive symptoms could have long-term positive effects.

Keywords: maternal depression, adolescent friendship quality, social skills, longitudinal, mediation

Public significance statement:

Exposure to maternal depressive symptoms is a common childhood experience. This study revealed that children's exposure to maternal depressive symptoms in early childhood predicted later adolescent friendship quality, partly via children's social skills. Children exposed to maternal depressive symptoms may benefit from targeted efforts to build their social skills. Preventing and treating maternal depressive symptoms could boost children's later social well-being, which itself predicts later well-being and health.

The developmental period of adolescence is characterized by numerous biological, psychological, and social changes, including the increasing importance of intimate peer relationships, as young people move toward more independence from parents, and friendship relationships become central sources of support (Meeus, 2016). Therefore, an important developmental task in this period of life is forming high quality bonds with peers. Indeed, the quality of a person's friendships in adolescence can influence their life and well-being for decades to come – positive friendship quality (i.e., friendship relationships characterized by intimacy, mutual support, trust, and low conflict) during adolescence is associated with the quality of romantic relationships, professional success, and mental and physical well-being more than a decade later in adulthood (Allen et al., 2015, 2021, 2022; Narr et al., 2019). Accordingly, adolescent friendship quality is an important precursor of future well-being. What impedes the development of positive friendship quality during adolescence is largely unknown, but likely includes developmental processes from early childhood onwards.

Mothers navigate and influence their children's social lives in many important ways (e.g., by organizing playdates, allowing children to socialize with friends), but maternal depressive symptoms are typically overlooked when it comes to understanding children's friendship development. Yet, (maternal) depressive symptoms are often accompanied by a lack of social motivation (i.e., social anhedonia), notable changes in social behaviors (e.g., withdrawal from social situations, engaging in less sensitive and more harsh parenting behaviors), and difficulties in social relationships (Goodman et al., 2020;

Kupferberg et al., 2016). These, in turn, could affect children's social development (i.e., their social motivation, behaviors, and relationships). Indeed, social theories of the intergenerational transmission of depression suggest that maternal depressive symptoms in early childhood are initially linked with children's adjustment difficulties through the impairment of children's social skills (Hammen et al., 2003). Therefore, the current study examined whether maternal depressive symptoms during early childhood predict children's friendship quality into adolescence, and whether more negative parenting behavior and children's social skills and their own depressive symptoms in middle childhood mediate these associations.

Maternal depressive symptoms and their children's social well-being

Approximately 20% of children are exposed to maternal depressive symptoms of clinical relevance, and many more are exposed to their mother's subclinically elevated depressive symptoms at some point (Abel et al., 2019; Campbell et al., 2009; Ertel et al., 2011). Thus, exposure to maternal depressive symptoms is a common childhood experience. Depressive symptoms often co-occur with poorer social well-being, which is reflected in social behaviors and altered cognitive and emotional processing of social situations, including communication and perspective-taking, empathy, social motivation, and cooperation (Kupferberg et al., 2016). Maternal depressive symptoms that last over longer periods of time are especially likely to affect children's social development, as children learn ineffective interaction patterns or imitate how their

mothers (suboptimally) interact with others. In turn, ineffective interaction patterns likely become particularly consequential when children enter elementary school and spend increasing amounts of time with new peers and build new friendships (Blair et al., 2015).

Maternal depressive symptoms have been linked to less maternal sensitivity and contingency in their relation with their children and also to children's less secure attachment styles (Goodman et al., 2020). Accordingly, it is plausible that these experiences transfer to children's social behavior in the peer context. Indeed, children's initial relationships with their parents provide a training ground for later relationships, and the disruption of children's attachment security to their parents during childhood has been linked to lower social competence and poorer relationship functioning with peers, including adolescent friendship quality (Groh et al., 2014; Schneider et al., 2001). Furthermore, the limited literature on maternal depressive symptoms and children's peer functioning reported that exposure to maternal depressive symptoms predicted an increased risk of becoming a victim of peer bullying (Azeredo et al., 2017; Maruyama et al., 2019; Nomaguchi & Fettro, 2020). Still, maternal depressive symptoms have rarely been examined as predictors of children's friendship relationships.

Although peer victimization and friendship quality are correlated, friendship quality is distinct from peer victimization (Flannery & Smith, 2017). Friendship quality refers to the characteristics of voluntary dyadic relationships that a person has with peers (Flannery & Smith, 2017; Rubin et al., 2011; Schacter et al., 2021). Positive friendship quality is characterized by closeness, mutual support, trust, self-disclosure, intimacy, companionship, and low conflict. Such friendships typically first

emerge during adolescence, as cognitive and emotional capabilities mature (Hartup & Stevens, 1997; Selman, 1980), and constitute a foundational experience for intimate relationships in adulthood, including those with romantic partners (Allen et al., 2019). Thus, much remains to be learned about the role of maternal depressive symptoms in early childhood on children's friendship quality development in childhood and adolescence.

The few studies on maternal depression and children's friendship quality suggest that small negative associations between maternal depressive symptoms and positive friendship quality and peer aggression can be observed before adolescence (Côté et al., 2018; Hipwell et al., 2005). Although the nature of friendship relationships changes considerably from middle childhood to mid-adolescence – from relationships characterized by main features such as companionship to relationships characterized by emotional intimacy – high quality friendships tend to be stable in early adolescence (Hiatt et al., 2015; Marengo et al., 2018). This is in line with research suggesting that the adolescent transition consolidates individual differences in social functioning (Monahan & Steinberg, 2011), such that stability of friendship quality from middle childhood onward could subsequently be one mechanism by which maternal depressive symptoms in early childhood and later adolescent friendship quality are linked. Therefore, our first hypothesis is that maternal depressive symptoms in early childhood are associated with poorer friendship quality in adolescence through an earlier association with poorer friendship quality during childhood and the subsequent stability of friendship quality across time.

Indirect associations from maternal depressive symptoms to adolescent friendship quality

The association of maternal depressive symptoms and their children's later friendship quality likely involves other developmental pathways. On the one hand, altered parenting behavior in the context of maternal depressive symptoms is a plausible mediator of this association. Considering core symptoms of depression (e.g., negative affect and lack of pleasure, preoccupation with one's own thoughts and feelings, overwhelm), mothers with high levels of depressive symptoms may struggle to be sensitive and present when interacting with their children, show less positive affect during these interactions, and be more easily stressed and harsh (Dix & Meunier, 2009; Goodman et al., 2020). These parenting behaviors, in turn, have been shown to be associated with children's friendship quality (Blair & Perry, 2019; Cook et al., 2012). Therefore, our second hypothesis is that more negative parenting behavior – as observed in mother-child interactions in the laboratory – mediates the association of maternal depressive symptoms in early childhood and children's friendship quality.

On the other hand, the role of child characteristics, especially those that are theorized and have been documented to impair the development of positive friendship qualities, such as children's social skills and their own depressive symptoms, has not been examined in this context. These pathways may be especially salient during middle childhood when children spend many hours in school with their peers. Coincidentally, this is also the period when the nature of children's friendship relationships

begin to shift to become more reciprocal, intimate, and egalitarian. Children with poorer social skills and more depressive symptoms likely struggle to react adequately to these changing relationships (Hartup & Stevens, 1997; Selman, 1980; Youniss, 1982). Accordingly, middle childhood is an important period for understanding precursors of adolescent friendship quality.

Children's social skills as a pathway from maternal depressive symptoms to adolescent friendship quality

Social skills are part of the larger construct of social competence, which describes how effectively individuals engage with others (Junge et al., 2020). Social skills refer to the basic skills necessary for positive and effective social interactions in different contexts and include empathy, social problem-solving, and communication (Junge et al., 2020). All of these aspects of social skills can affect friendship quality negatively: young people struggling with social skills may have difficulty accurately perceiving their friend's emotional state and reacting sensitively, find it difficult to effectively navigate conflict situations, or fail to adequately express their own needs and wishes in the relationship (Blair et al., 2015; Junge et al., 2020). Therefore, social skills constitute an important foundation for the development of positive friendship quality across the lifespan which has been consistently empirically documented (e.g., Blair et al., 2015; Junge et al., 2020; Steinhoff & Keller, 2020).

Indeed, an earlier 5-year longitudinal study, which analyzed data from the cohort used in the present study found that children's social skills at age 7 predicted children's friendship quality at age 10 (Blair et

al., 2015). Importantly, however, the role of maternal depressive symptoms as a predictor of this association was not examined and thus, did not answer the question whether children's social skills *mediate* the association of maternal depressive symptoms and children's friendship quality. That study also ended with age 10 and did not examine the longer term persistence of the social skills-friendship quality association into mid-adolescence (i.e., age 15). This is important to consider regarding the developmental relevance of this question in adolescence. In the context of maternal depressive symptoms, the development of children's social skills is likely impaired. High levels of maternal depressive symptoms could result in mothers' fewer sensitive interactions, and also harsher and more unpredictable interactions with their children (Goodman et al., 2020); this could directly affect children's social development (Raby et al., 2015; Shaffer et al., 2009). Moreover, biological risk for depression may predispose young people to social difficulties (Holmes et al., 2012).

Indeed, maternal depressive symptoms have been linked to children's poorer social skills (Goodman et al., 2011), including fewer prosocial behaviors (Davé et al., 2008; Elgar et al., 2007; Maruyama et al., 2019), and less cooperation, constructive assertion, and self-control (DeRose et al., 2014; Wu et al., 2011), and more antisocial behaviors (Alpern & Lyons-Ruth, 1993; Gross et al., 2009; Shaw et al., 2016). Therefore, our third hypothesis is that maternal depressive symptoms in early childhood may initially predict the previously documented associations of children's poorer social skills and friendship quality in middle childhood, and that children's social skills partially mediate the

association of maternal depressive symptoms in early childhood and poorer *adolescent* friendship quality (i.e., at age 15).

Children's depressive symptoms as a pathway from maternal depressive symptoms to adolescent friendship quality

Children's depressive symptoms likely also play a role in the association of maternal depressive symptoms with adolescent friendship quality. Maternal depressive symptoms are an established risk factor for children's internalizing symptoms, including depressive symptoms (Goodman et al., 2011; Weissman et al., 2016). Research on the intergenerational transmission of depressive symptoms suggests complex mechanisms that include 1) a genetic predisposition to experiencing depressive symptoms in some families, 2) exposure to emotion dysregulation in parents, resulting in potentially less positive and also harsher parenting behavior, and 3) pathways through altered neurodevelopment and more stressful environments (Branje et al., 2020; Burkhouse & Kujawa, 2022; Goodman & Gotlib, 1999). Indeed, the association of maternal and child depressive symptoms is one of the most robust findings in developmental psychopathology research, with associations documented around the globe (McLaughlin et al., 2012), long time-spans (Weissman et al., 2016), and across multiple generations (Weissman et al., 2005).

Children's depressive symptoms, in turn, can be associated with increased difficulties in forming close and intimate friendships through, for example, altered social behaviors and subsequent stress generation (i.e., interpersonal difficulties as a consequence of ineffective social

interactions). Indeed, a recent meta-analysis documented small but consistent associations between depressive symptoms and friendship experiences, including over time (Schwartz-Mette et al., 2020).

For example, peers may not enjoy interacting with a child who frequently displays negative affect. They may also have limited patience for behaviors and emotions commonly displayed in the context of depressive symptoms, including excessive reassurance-seeking, low self-esteem, low social motivation, or social withdrawal (Rudolph, 2009, 2017). Consequently, children with depressive symptoms may miss out on opportunities for positive social experiences and the developmental benefits of high-quality friendships as they transition from middle childhood to adolescence. Therefore, our fourth hypothesis is that children's higher levels of depressive symptoms partially mediate the association of maternal depressive symptoms in early childhood and later adolescent friendship quality.

Interrelation of negative parenting behavior, children's social skills, and depressive symptoms in middle childhood

The hypothesized indirect paths are likely not independent. As described above, negative parenting behavior is one way by which maternal depressive symptoms are theorized to be associated with children's social skills (Goodman et al., 2020; Raby et al., 2015; Shaffer et al., 2009) and depressive symptoms (Branje et al., 2020; Goodman & Gotlib, 1999). Also, social difficulties in youth can be both a precursor and a consequence of depressive symptoms (Burt et al., 2008; Dryburgh et al., 2021; Huber et al., 2019; Kochel & Bagwell, 2017; Kupferberg et al., 2016). Children's

difficulties in expressing themselves or understanding others may leave them frustrated with the ineffectiveness of their social interactions, which could increase their negative emotions and feelings of inferiority (e.g., Barzeva et al., 2020; Nilsen et al., 2013). Children's depressive symptoms and preoccupation with their own negative thoughts can also undermine the development of social competence and limit their opportunities for meaningful social interactions (e.g., Kochel & Bagwell, 2017; Rudolph, 2017). In sum, negative parenting behavior, social skills, and depressive symptoms likely reciprocally influence each other during middle childhood, and the pathways from maternal depressive symptoms to adolescent friendship quality through these processes are likely not just parallel processes. Therefore, our fifth hypothesis is that the pathways through negative parenting behavior, children's social skills, and children's depressive symptoms are interrelated.

Potential gender differences in pathways

Research on maternal depression and children's mental health suggests that boys and girls may be differentially affected, with girls more likely to experience elevated symptoms of depression in the context of maternal depressive symptoms than boys (Goodman et al., 2011). Pathways from maternal depression to adolescent friendship quality could also differ for boys and girls. Although research points to the pervasive impact of gendered parenting on child behavior (Aznar & Tenenbaum, 2020; Endendijk et al., 2016; Mesman & Groeneveld, 2018; Morawska, 2020), these associations seem to be found for specific behaviors, rather than for

global parenting dimensions as examined in this study. Also, parenting has been documented to mediate the association of maternal depressive symptoms and child outcomes for both boys and girls (Goodman et al., 2020). We therefore don't expect sex differences in the indirect path through negative parenting behavior.

For child characteristics, research has shown that females experience more depressive symptoms in response to poorer social skills than males, potentially because of different socialization experiences and expectations and because girls' distress may be more likely to manifest as depressive symptoms (Hammen et al., 2008; Nilsen et al., 2013). This suggests that the pathways through children's social skills and depressive symptoms may be more strongly interrelated in females than in males. Yet, a recent meta-analysis of the association between depressive symptoms and friendship quality did not find that this association is moderated by gender (Schwartz-Mette et al., 2020). In addition, considering that females tend to report more positive friendship quality and more expectations for intimacy, loyalty, and solidarity than males (Hall, 2011; Rose & Rudolph, 2006), different types of social skills may be needed for females and males to be effective in establishing positive friendship relationships (Rose & Asher, 2017). Therefore, the current study explored gender differences in pathways from maternal depressive symptoms in early childhood to adolescent friendship quality.

The current study

Using multi-informant data (from mothers, children, and teachers) from a longitudinal cohort study from North Carolina, U.S., this study took a longer-term longitudinal perspective on the association of mother-

reported maternal depressive symptoms in early childhood and child-reported adolescent friendship quality across a 13-year period. Within this time frame, our analysis tested indirect associations via observed negative parenting behavior (i.e., less sensitive and positive and more hostile), children's teacher-reported social skills and child-reported depressive symptoms in middle childhood (see **Figure 1** for a conceptual model). Since negative parenting, and children's social skills, depressive symptoms, and friendship quality are likely reciprocally linked across time (Dryburgh et al., 2021; Huber et al., 2019), we also tested such cross-paths. Finally, we explored gender differences. The analyses were adjusted for family socioeconomic status (SES), single motherhood, and race/ethnicity (Ertel et al., 2011; Iruka et al., 2022; Letourneau et al., 2013), and children's early externalizing symptoms (Chang et al., 2012; Shaw et al., 2016), which could confound some of the associations tested here.

This study also builds on previous research with this sample. Among other findings, these previous studies documented developmental cascades from maternal depressive symptoms in early childhood to adolescent well-being (i.e., academic achievement, unhealthy behaviors) including depressive symptoms (Bechtiger, Steinhoff, Dollar, Calkins, et al., 2022; Bechtiger, Steinhoff, Dollar, Halliday, et al., 2022). A second line of research documented that different domains of social competence (including social skills and friendship quality) are interrelated across early and middle childhood, and that these are linked to children's emotion regulation strategies and parental emotion socialization (Blair et al., 2016; Blair et al., 2014, 2015). We now integrate and extend these

two perspectives by examining whether negative parenting behaviors and children's socio-emotional competences mediate the association between maternal depressive symptoms and adolescent friendship quality as an indicator of social well-being.

METHODS

Sample description

This study used data from three cohorts of children and their primary caregivers who are part of an ongoing longitudinal study of social and emotional development. The study initially recruited 447 families through childcare centers, the County Health Department, and the local Women, Infants, and Children program. The goal for recruitment was to obtain a sample of children who were at risk for developing future externalizing behavior problems and who were representative of the surrounding community (i.e., a mid-sized city in North Carolina) in terms of race and SES. The families were assessed when the children were 2, 4, 5, 7, 10, and 15 years of age. At each assessment, mother and child visited the research laboratory. Two experimenters were present during laboratory visits, one with the child and one in a different room with the mother. Also at each assessment, children's preschool (if applicable) or main school teachers were invited to participate in the assessment via a mail-out questionnaire.

A detailed description of the recruitment process, along with an attrition analysis of the sample, is presented in the online supplement. Briefly, families with lower SES at child age 2 were less likely to

participate in the age 7 assessment than families with higher SES, and male adolescents were less likely to participate in the age 15 assessment than female adolescents. The analytic sample in this study consisted of *n* = 396 participants with data on exogenous variables (i.e., family SES, single motherhood, child race/ethnicity, child gender, and child externalizing behavior at age 2). Female and male children were roughly equally represented (48% males). Two-thirds (67%) of the children in the analytic sample were White, 26% were Black, and 7% were mixed race or of another race or ethnicity. The current sample included families from all social strata (range of Hollingshead index (Hollingshead, 1975): 14–66; *M* = 39.47, *SD* = 11.14, with scores from 40 to 54 representative of middle class).

Measures

Maternal depressive symptoms were assessed at child ages 2, 4 (Cohorts 1 and 2 only), and 5, using the depression subscale of the Symptom Checklist-90 Revised (SCL-90R), a self-report measure that assesses a broad range of psychopathological symptoms (Derogatis, 1994). Mothers rated whether 90 symptoms had caused them distress over the previous 7 days on a 5-point scale, ranging from 0 = *not at all* to 4 = *extremely*. The depression subscale of the SCL-90R consists of 13 items (Cronbach's α =.87, α =.91, α =.89 at child ages 2, 4, and 5, respectively), which assess symptoms such as lack of interest and motivation, low energy, and feelings of hopelessness (e.g., "feeling low in energy or slowed down," "feelings of worthlessness," and "feeling lonely"). We used these three assessments to model a latent factor of maternal depressive symptoms to capture stable levels of depressive

symptoms during the early childhood period, as we did previously (Bechtiger, Steinhoff, Dollar, Halliday, et al., 2022).

Negative parenting behavior was assessed with data from three different observed parent-child interaction tasks at ages 7 and 10. At both assessments, mother and children came to the research laboratory and participated in three behavioral tasks: the puzzle box task (5 min), the craft task (6 min), and the craft clean up task (5 min; Eisenberg et al., 1997). These tasks involved putting together a puzzle that children could not see according to their mothers' instructions (puzzle box task), working together on a craft task, and cleaning up the materials that were used for the craft task (clean up task). Each task was coded for maternal hostility (e.g., overt rejection of child, expressions of anger and annoyance), maternal supportive presence (e.g., expression of verbal encouragement and emotional support, emotional and physical involvement in task at hand, providing a warm environment), and maternal positive affect (e.g., expression of enjoyment and enthusiasm, laughing). All behaviors were independently coded by two trained coders. The reliability of the two raters was calculated at ages 7 and 10 for 21% and 20% of the puzzle box tasks ($\kappa = .74$ and $\kappa = .90$ for hostility; $\kappa = .73$ and $\kappa = .80$ for supportive presence; $\kappa = .72$ and $\kappa = .84$ for positive affect); for 22% of the craft tasks at age 10 ($\kappa = .80$ for hostility; $\kappa = .73$ for supportive presence; $\kappa = .78$ for positive affect); and for 21% of the craft clean-up tasks at age 10 ($\kappa = .92$ for hostility; $\kappa = .83$ for supportive presence; $\kappa = .83$ for positive affect), respectively. For each parenting behavior, a mean of the three tasks was created. For supportive presence and positive affect, this mean was recoded so that

higher values indicate less supportive presence and positive affect. At both ages, the three indicators of negative parenting behavior were averaged to get an overall score for negative parenting behavior.

Child depressive symptoms were self-reported on the Children's Depression Inventory (CDI) at ages 7 and 10 (Kovacs, 1992). At age 7, the experimenters read aloud the items to the children while pointing at each item. Children then responded by circling their response. For each of 27 items, the participants chose among three sentences to best describe their feelings in the past two weeks (e.g., "I am sad once in a while," "I am sad much of the time," and "I am sad all the time"). For each answer, a score from 0 to 2 was assigned, with higher values indicating more depressive symptoms. The scale has five subscales (negative mood, interpersonal problems, ineffectiveness, anhedonia, and low self-esteem). For the analyses, the total score was used, which was the average of all items. A higher score reflects more depressive symptoms. Internal consistency was at $\alpha = .82$ and $\alpha = .89$ for ages 7 and 10, respectively. At age 7, only participants in Cohorts 2 and 3 completed the CDI.

Children's social skills were teacher-rated on the social skills rating scale (SSRS; Gresham & Elliott, 1990) when the children were aged 7 (second grade) and 10 (fifth grade). The SSRS assesses children's social skills with 30 items from three subscales: cooperation (e.g., "controls temper with peers"), assertion (e.g., "introduces herself"), and self-control (e.g., "compromises in conflict"). Items were rated on a scale from 0 = *never* to 2 = *very often*. The mean of the three subscales was used ($\alpha = .77$ and $\alpha = .81$ at ages 7 and 10, respectively). A higher score reflects better social skills.

Friendship quality was self-reported by the participants at ages 7, 10, and 15 on an adapted version of the Friendship Quality Questionnaire (FQQ; Parker & Asher, 1993). The FQQ asks children about their best friends and what they do with that best friend. The items reflect the companionship and recreation subscales (e.g., “you and (name of friend) always sit together at lunch”), validation and caring (e.g., “(name of friend) tells you you’re good at things”), help and guidance (e.g., “(name of friend) helps you so you can get things done more quickly”), intimate disclosure (e.g., “you and (name of friend) talk about things that make you sad”), conflict resolution (e.g., “you and (name of friend) always make up easily when you have a fight”), and conflict and betrayal (e.g., “you and (name of friend) get mad at each other a lot”). The conflict and betrayal subscales were reverse coded. The mean across all available items for the respective assessments was used in the analyses as an indicator of total friendship quality. A higher score reflects a more positive friendship quality. At age 7, a shorter version of the FQQ was assessed with 20 items (α = .76). At ages 10 and 15, all 39 items of the FQQ were assessed (α = .93 and α = .94 at ages 10 and 15, respectively). All items in the short version are also included in the long version and all subscales were represented in the short version. Items were rated from 0 = *no* to 4 = *really true*.

Covariates at age 2: *Family SES* was measured using the Hollingshead index (Hollingshead, 1975), a composite four-factor index score considering education, occupation, and gender. If two parents were present in the household, an index was calculated for each of them; these were then averaged. *Single motherhood* was operationalized as 0 =

(re-)married and 1 = single, divorced, or separated (19%). *Child race or ethnicity* was operationalized as 0 = White (67%) and 1 = Other (33%). *Child gender* was parent-reported at age 2 and coded as 0 = male and 1 = female. *Child externalizing behavior* was mother-reported using the *T*-score of the externalizing composite of the Child Behavior Checklist for 2- to 3-year-olds (Achenbach, 1992). Mothers rated 26 items (11 items from the destructive behavior subscale, $\alpha = .75$, and 15 items from the aggressive behavior subscale, $\alpha = .88$) related to aggressive, destructive, and oppositional behaviors on a three-point scale from 0 = *not true* to 2 = *often true*.

Transparency and openness

We report how the analytic sample size was achieved, extensive attrition analyses across the six study waves, all measures used in the study, and all data manipulations. The data and material are not publicly available because participants' consent for public data sharing was not obtained when the study began in the 1990s. Data can be requested from the principal investigators of the study. The analysis code is made available at the first author's OSF profile (Bechtiger, 2024). Data were analyzed using R, version 4.2.1 (R Core Team, 2022), in RStudio, version 2022.12.0+353, and the package *lavaan* (Rosseel, 2012), version 0.6-11. This study's design and its analysis were not pre-registered.

Data analysis

The hypotheses were tested in a series of path models using the lavaan package (Rosseel, 2012) in R. First, a path model was specified that included the hypothesized associations between the main variables (Figure 1). This model included 1) maternal depressive symptoms in early childhood as a predictor of negative parenting behavior, children's social skills, friendship quality, and depressive symptoms at age 7 and the direct association of maternal depressive symptoms in early childhood with friendship quality at age 15; 2) the stability of negative parenting behavior and children's social skills, friendship quality, and depressive symptoms from ages 7 to 10; 3) cross paths among negative parenting behavior, children's social skills, friendship quality, and depressive symptoms from ages 7 to 10; and 4) associations of negative parenting behavior and children's social skills, friendship quality, and depressive symptoms from age 10 with friendship quality at age 15. All possible indirect paths from maternal depressive symptoms to friendship quality at age 15 were estimated in the model. All constructs assessed at the same point in time were allowed to covary.

After estimating an unadjusted model (see supplementary materials for coefficients of unadjusted model), covariates were included in two steps: first, all demographic covariates at age 2 were included in the model. Second, children's externalizing behaviors at age 2 were added. After both steps, covariates with a *p*-value >.10 were removed from the model for parsimony. Externalizing symptoms at age 2 were also specified as a predictor of maternal depressive symptoms in early childhood, as not doing so led to a poor model fit (as became evident from the modification indices). Children's externalizing symptoms may have been an indicator

for a more stressful family climate where mothers are more likely to experience elevated depressive symptoms. The final model adjusting for sociodemographic characteristics and children's externalizing symptoms is presented in the results section. The results did not change much with the inclusion of externalizing symptoms as a covariate.

Maximum likelihood estimation and bootstrapped standard errors (5,000 draws) were used for model estimation. Full information maximum likelihood (FIML) was used for missing data so that all available data points were included in parameter estimation (Enders & Bandalos, 2001). An acceptable model fit was indicated by a nonsignificant χ^2 value, together with comparative fit index (CFI) ≥.95, root mean square error approximation (RMSEA) ≤.06, and square root mean residual (SRMR) ≤.08 (Hu & Bentler, 1999). To test the significance of indirect effects, we applied the product-of-coefficients method and reported bias-corrected bootstrapped confidence intervals (MacKinnon et al., 2004).

Gender differences were explored using a multi-group framework. To assess whether any of the direct paths between the core study variables varied by gender, we compared the most parsimonious model (i.e., all structural paths constrained to be equal across gender) to a model where all paths were freely estimated. In both models, the loadings of the latent maternal depressive symptoms factor were constrained to be the same for females and males to ensure the latent factor measuring the same construct in the two groups. The fit statistics of the models were then compared, with a nonsignificant χ^2 difference test indicating no difference between models. In addition, ΔCFI ≤ .01, ΔRMSEA ≤ .015, and ΔSRMR ≤ .01 further suggested model invariance (Chen, 2007; Little,

2013). Additionally, we used Wald tests to formally test equivalence of indirect effect parameters for males and females in the free multi-group model.

RESULTS

Descriptive statistics and correlations of the study variables are presented in Table 1. The correlations suggest that maternal depressive symptoms in early childhood were negatively correlated with children's social skills at ages 7 and 10 and with higher levels of child depressive symptoms at these ages. Maternal depressive symptoms in early childhood were also significantly correlated with lower friendship quality in adolescence but not with lower friendship quality at ages 7 and 10. Maternal depressive symptoms were not significantly correlated with negative parenting behavior. Child social skills and negative parenting behavior at age 7, but not child depressive symptoms and negative parenting at age 10, were positively correlated with friendship quality in adolescence. At age 7, child depressive symptoms were negatively correlated with children's friendship quality and negative parenting behavior was correlated with children's social skills. At age 10, all hypothesized mediating child characteristics were correlated with each other, but not with negative parenting behavior. Correlations by gender are presented and discussed in the online supplement.

The results from the final path model are presented in Figure 2 and Table 2. Maternal depressive symptoms in early childhood were significantly linked with children's poorer social skills at age 7, but not with negative parenting behavior or children's friendship quality or child

depressive symptoms at that age. In turn, children's social skills at age 7 were significantly associated with children's higher friendship quality and children's lower depressive symptoms at age 10. Only friendship quality at age 10 was significantly associated with friendship quality at age 15. No significant associations of negative parenting behavior and children's depressive symptoms and later social skills or friendship quality emerged.

Although maternal depressive symptoms in early childhood were no longer directly associated with adolescent friendship quality in the path model compared to the bivariate correlations, indirect links with adolescent friendship quality were found. Specifically, maternal depressive symptoms in early childhood were indirectly linked with friendship quality at age 15, initially through the association of higher levels of maternal depressive symptoms with poorer social skills at age 7. In turn, these poorer social skills were associated with more negative friendship quality at age 10. Subsequently, the stability of friendship quality from age 10 to age 15 carried the effect forward (b = –0.02, 95% CI [–0.07, –0.00]). No other indirect effects from maternal depressive symptoms to adolescent friendship quality emerged. However, maternal depressive symptoms were also indirectly associated with children's depressive symptoms at age 10 through children's poorer social skills at age 7 (b = 0.04, 95% CI [0.01, 0.11]): higher levels of maternal depressive symptoms in early childhood were associated with poorer social skills at age 7, which, in turn, predicted higher levels of children's depressive symptoms at age 10. At ages 7 and 10, only the covariance of residuals of friendship quality and child depressive symptoms was consistently significant, likely capturing same-reporter bias.

Three sensitivity analyses were conducted. First, the sample was restricted to the two cohorts that completed the CDI at age 7. Second, the short version of the FQQ was used for all ages. Third, maternal depressive symptoms at ages 7 and 10 were included in the model instead of negative parenting behavior to examine whether the continuity of maternal depressive symptoms across time accounts for the observed indirect associations. All sensitivity analyses confirmed the main results described above. The results of the sensitivity analyses are presented in the online Supplement.

The fit statistics of the least and most constrained multigroup models were used to compare whether the associations between maternal depressive symptoms and children's social skills, depressive symptoms, and friendship quality differed for females and males. A comparison of the model fit statistics ($\Delta\chi^2$= 17.288 (15), p = .302, ΔCFI=.003, ΔRMSEA=.002, ΔSRMR=.004) showed no significant difference between the most free (χ^2 = 176.411 (133), p =.007, CFI=.938, RMSEA=.041, SRMR=.062) and most constrained model (χ^2 = 193.699 (148), p =.007, CFI=.935, RMSEA=.039, SRMR=.066) , suggesting that the associations of these variables do not significantly differ by gender. Examining sex differences for the hypothesized indirect paths in the free model using Wald tests confirmed this finding – no difference between the indirect effect parameters estimated for males and females emerged.

DISCUSSION

Having friendships characterized by intimacy, closeness, and trust during adolescence predicts later well-being and adjustment in many areas of life (Allen et al., 2015, 2021; Narr et al., 2019). To date, long-term longitudinal studies that examine childhood predictors of and pathways to positive friendship qualities in adolescence have been rare. Here, we examined maternal depressive symptoms in early childhood as a risk factor for adolescent friendship quality, and examined pathways of this association via negative parenting behaviors and children's social skills and depressive symptoms in middle childhood.

We used a prospective longitudinal, multi-informant community study with six repeated measures in three developmental periods (i.e., early childhood, middle childhood, and adolescence). Our findings revealed a small, negative, bivariate association of exposure to maternal depressive symptoms across ages 2 to 5 years and adolescent friendship quality more than a decade later, at age 15. This association was mediated primarily by children's poorer social skills at age 7 and the stability of friendship quality across time, extending previous 5-year longitudinal analyses with this dataset by showing that the documented association of social skills at age 7 and friendship quality at age 10 may be initiated by exposure to maternal depressive symptoms in early childhood and can have longer-term consequences on adolescent friendship quality over the course of 13 years.

Of note, all effect sizes identified and discussed in this study were generally small. This was to be expected, considering the probabilistic nature of early childhood risk for later adjustment, the 15-year time span of the study, measurements of the key constructs via assessments by

different reporters, and analyses that adjust for the stability of most constructs over time (Cox et al., 2010; Gottlieb, 2007; Götz et al., 2021). Nevertheless, small effect sizes are meaningful, given the accumulation of effects in chains of risk over time (Götz et al., 2021). Notably, despite being small in size, the effects found here were robust to the measures used, as suggested by the sensitivity analyses.

Children's friendship quality

Our first hypothesis stated that friendship quality in middle childhood would mediate the association of maternal depressive symptoms in early childhood and adolescent friendship quality. Although friendship quality was moderately stable from middle childhood to adolescence, maternal depressive symptoms did not predict children's friendship quality at age 7. This contrasts with the few studies that examined friendship quality in the context of maternal depressive symptoms and found small, negative associations. Methodological differences may account for this discrepancy: one study aggregated friendship quality across middle childhood (rather than examining friendship quality at multiple time points) and acknowledged the low reliability of its measure of friendship quality (Côté et al., 2018). Another study focused explicitly on observed peer aggression (Hipwell et al., 2005), rather than self-reported measures of both positive and negative features of friendship quality.

The nature of children's friendships changes substantially during middle childhood, when, initially, they are mainly characterized by proximity, companionship, and joint activities (Hartup & Stevens, 1997). With the onset of adolescence, emotional intimacy, closeness, and trust

become defining features of positive friendships, and establishing such friendship relationships becomes a central developmental task. The measure of friendship quality used in the current study primarily reflected the emotional features of adolescent friendships (e.g., intimate disclosure). Other aspects of friendship (e.g., group-based activities) in the context of maternal depression may not have been adequately captured here. Also, maternal depressive symptoms may primarily affect relationship features that need the development of certain emotional skills (e.g., empathy, sympathy) that continue to develop in adolescence. Associations of maternal depressive symptoms with children's friendship quality may only become visible during adolescence, when intimate disclosure and trust become more prominent friendship features.

Negative parenting behavior

Our second hypothesis, that negative parenting behavior would mediate the association between maternal depressive symptoms and adolescent friendship quality, was not confirmed. Unexpectedly, negative parenting behavior was neither correlated with maternal depressive symptoms nor with most of the examined aspects of children's social emotional development in this sample. This contradicts a large theoretical and empirical literature that suggests that altered parenting behavior mediates the association of maternal depressive symptoms and child adjustment in various socio-emotional outcome domains (see Goodman et al., 2020 for a comprehensive review and meta-analysis). Several explanations of this lack of association are plausible. Methodologically, most of the literature on maternal depressive symptoms and parenting behavior with school aged children do not use observed ratings available

from multiple interaction tasks to assess parenting behavior and often relies on mother-reports for maternal depressive symptoms, parenting behavior, and child characteristics (Goodman & Gotlib, 1999; Goodman et al., 2020). The multi-method (i.e., questionnaires, observations) and multi-reporter (i.e., mothers, teachers, children) data analyzed in this study likely reduced some of the shared-method variance present in earlier studies and could have resulted in the present null findings, as could the large time spans between assessments (i.e., 2 to 5 years).

Also, the null findings identified here may indicate that mothers from the community can display socially desired behavior during a 15 min laboratory task, even if everyday behavior may be altered in the presence of high levels of depressive symptoms. More substantively, there is some evidence for individual differences in parenting behavior in the context of maternal depressive symptoms (Wang & Dix, 2013). In other words, not all parents who experience high levels of depressive symptoms also show altered parenting behavior – this may be particularly likely in community samples like ours, where a large number of participants shows relatively few depressive symptoms. The relatively sizeable correlation of negative parenting behavior at age 7 and at age 10 (r=.45) and the significant correlations with children's race/ethnicity and single motherhood suggest that stable individual differences in parenting behavior exist, which may be related to sociodemographic differences. Future research should examine the potential moderating effect of parenting behavior in the association of maternal depressive symptoms and adolescent friendship quality.

Children's social skills

Our third hypothesis stated that children's social skills would mediate the association of maternal depressive symptoms and adolescent friendship quality. Our findings suggest that poorer social skills at age 7 constitute a key juncture in this chain, as they predicted poorer friendship quality at age 10 (which, in turn, predicted poorer friendship quality at age 15). This extends findings from a previous 5-year-longitudinal study from this sample that had documented an association of social skills at age 7 with friendship quality at age 10 and suggests that exposure to maternal depressive symptoms may initiate this developmental cascade, which, in turn, can have longer-term developmental associations with friendship quality into mid-adolescence (i.e., age 15). Although previous research reported associations of maternal depression with less cooperation, assertion, and self-control during adolescence (DeRose et al., 2014), our findings suggest that associations with children's social skills are already present at the beginning of elementary school, with downstream predictions of friendship quality at age 10 and beyond.

Our finding of a pathway from earlier social skills to later positive friendship quality is consistent with other previous work, which also supports this direction of effects (Bechtiger et al., 2021; Blair et al., 2015; Steinhoff & Keller, 2020). Notably, in our model, poorer social skills at age 7 predicted poorer friendship quality at age 10, but poorer social skills at age 10 no longer predicted poorer friendship quality at age 15 over and above the indirect effect of earlier social skills through friendship quality at age 10 (the longer time span between ages 10 and 15 than between ages 7 and 10 has to be noted). This was unexpected considering the developmental shift in the nature of friendships from

companionship to emotional intimacy that occurs from middle childhood to adolescence that we assumed would be facilitated by children's social skills. Yet, it seems that social skills at the beginning of primary school may be especially important for influencing the developmental shifts in friendship quality during the transition to adolescence. Also, social skills in the early school years may be important for establishing new friendships with peers, whereas friendships later on may also be influenced by shared relationship histories.

Several possibilities could explain why maternal depressive symptoms are associated with children's social skills at age 7. Besides processes such as altered parenting behavior (Goodman et al., 2020) and social learning processes (Hammen et al., 2003), biological risk for depression may predispose young people to social difficulties (Holmes et al., 2012). For example, familial risk for depression is associated with adolescents' altered neural sensitivity to social rewards independent of adolescents' depressive symptoms, suggesting associations of maternal depressive symptoms with social functioning regardless of offspring depression status (Kujawa & Burkhouse, 2017; Nazarova et al., 2022; Olino et al., 2015; Stretton et al., 2021). These processes need to be explored in future research.

Children's depressive symptoms

Our fourth hypothesis stated that children's depressive symptoms would mediate the association between maternal depressive symptoms and adolescent friendship quality. Yet, indirect associations from maternal depressive symptoms to adolescent friendship quality via

children’s depressive symptoms did not emerge, as children’s depressive symptoms at age 10 were not significantly associated with friendship quality at age 15. In fact, this is consistent with a recent meta-analysis that found that depressive symptoms and friendship quality are only linked in younger children (Schwartz-Mette et al., 2020). Considering the heterogeneous nature of depressive symptoms, high overall levels of children’s depressive symptoms may not necessarily pose a risk for friendship development without concurrent changes in social behavior (which, in our study, were more likely captured by teacher-reported social skills).

Further, in some settings, the intense and intimate exchange in high-quality friendships can also be associated with increased internalizing symptoms (e.g., through co-rumination; Rose, 2021). Therefore, a potential negative association of depressive symptoms with later friendship quality through processes such as social withdrawal or difficulties with emotion recognition in some people may be cancelled out by a positive association of depressive symptoms with later friendship quality in other people, whose friendship quality increases through shared rumination and problem talk (Rose, 2021). This process may be more salient in adolescence compared to childhood, considering that self-disclosure and problem talk become defining features of intimate friendships during this developmental period (Rose, 2021). These divergent associations may be exacerbated by the school transitions happening in middle childhood and early adolescence, when peer and friendship groups reshuffle.

Negative parenting behavior, child social skills, and child depressive symptoms

Our fifth hypothesis stated that the hypothesized pathways from maternal depressive symptoms to adolescent friendship quality through negative parenting behavior and children's social skills and depressive symptoms are interrelated. This was not the case because negative parenting behavior was not associated with child characteristics and children's depressive symptoms were not associated with adolescent friendship quality. Still, social skills at age 7 also predicted child depressive symptoms at age 10. This finding is consistent with social theories of depression positing that difficulties with social interactions contribute to increases in depressive symptoms, including theories that explain the intergenerational transmission of depression with children's social difficulties (Hammen et al., 2003; Kupferberg et al., 2016; Rudolph, 2017). Our finding that maternal depressive symptoms were not significantly associated with children's depressive symptoms at age 7 once covariates were included in the model further corroborates such an interpersonal perspective on the intergenerational transmission of depression, as it suggests that maternal depressive symptoms are first associated with children's social skills. As depressive symptoms become more prevalent with the onset of puberty (Rapee et al., 2019), poor social skills at age 7 may be a first warning sign, or a prodrome, of the subsequent emergence of depressive symptoms in some children. This is also in line with previous evidence showing that early social competence

is associated with later internalizing symptoms, and not the reverse (Bornstein et al., 2010).

Lack of gender differences

In contrast with previous findings that interpersonal difficulties in adolescence mediate the intergenerational transmission of depression in females but not in males (Hammen et al., 2008), we did not identify any gender differences in the indirect associations tested here. In contrast to that previous study, we examined the associations of maternal depressive symptoms and social competences across childhood. During early childhood, most children learn patterns of social understanding and behavior primarily in their immediate family, regardless of their gender. Thus, social processing and behaviors that seem normal in a family context characterized by maternal depressive symptoms may only later be recognized as problematic or inefficient when children enter school. It has to be noted that our sample was on the smaller side for such complex models; statistical power to detect small group differences may not have been adequate when splitting the sample by gender. Further exploring the role of gender further is an important direction for future research in this area.

Nevertheless, being male was associated with poorer social skills and friendship quality at every assessment point in this study. This is consistent with previous findings on gender differences in friendship quality, suggesting that female friendships are more focused on emotions and intimacy, whereas friendships among males may be more activity-based (Rose & Rudolph, 2006). Common measures of friendship quality,

including the one used in this study, do not usually capture the latter well (Rose & Asher, 2017).

Strengths, limitations, and future directions

This study has many strengths, including its sample of a prospective longitudinal, community-based cohort study. This allowed us to examine how variations in maternal depressive symptom levels in the community (rather than diagnoses of maternal depression) are associated with children's social and emotional development. This is important as not all people who suffer from depression are in treatment for their condition (Olfson et al., 2016) and depressive symptoms can also be impairing at subclinical levels (Angold et al., 1999; Ayuso-Mateos et al., 2010). This study comprised six repeated assessments across three developmental periods (early childhood, middle childhood, and adolescence) from multiple informants (mothers, children, and teachers) and observed parent-child interactions from multiple interaction tasks, which reduced same-reporter bias (Burt et al., 2005). In addition, the structural equation modelling framework allowed us to model multiple developmental cascades across multiple measurement points simultaneously. This analysis approach further made it possible to model maternal depressive symptoms during early childhood as a latent factor, which captured the average burden of maternal depressive symptoms across three time points. The availability of repeated measures of maternal depressive symptoms allowed us to conduct a sensitivity analysis in which we adjusted for the stability of maternal depressive symptoms in middle childhood and adolescence that confirmed the long-term indirect

associations of maternal depressive symptoms in early childhood with adolescent friendship quality.

The study also had several limitations. First, maternal social functioning could not be examined as a potential mediator because no measures of this construct was available in this study. Yet, negative parenting behavior, which captures less positive and sensitive and more hostile interactions with one's child, was unrelated to both maternal depressive symptoms and children's socio-emotional developmental in this study. Future research needs to understand how parental social functioning is linked with children's social functioning in the context of the intergenerational transmission of depression, and how parental social functioning relates to parenting behavior. A second limitation was that our analytic approach did not distinguish between-person differences from within-person change. Therefore, we cannot make conclusions about to which extent the identified associations are attributable to stable differences in mental health and social competence between families (for example, because of genetic confounding; Hart et al., 2021), or whether changes in maternal depressive symptoms are associated with changes in children's social skills. Nevertheless, our results suggest that those children who are exposed to high levels of maternal depressive symptoms during early childhood also tend to have poorer social skills, poorer mental health, and poorer friendship quality in childhood and adolescence compared to children exposed to lower levels of maternal depressive symptoms.

Third, the analysis did not account for time-varying confounders that could explain some of the associations identified. For example,

children's externalizing symptoms after age 2 were not considered in the analyses. Nevertheless, our analyses document a robust association of maternal depressive symptoms in early childhood with children's social skills at age 7 after adjusting for externalizing symptoms at age 2.

Fourth, negative parenting behavior, social skills, depressive symptoms, and friendship quality are all multidimensional constructs that contain different subscales. In this paper, we were interested in the overall associations among these constructs, but there could be more nuanced, symptom-specific associations that should be explored in future research. For example, the social anhedonia seen in people with depressive symptoms could be associated with not entering social situations in the first place, whereas difficulties with emotion recognition may be associated with less meaningful or more conflicted social interactions (Kupferberg et al., 2016).

Fifth, the identity and gender of the participants' friend that friendship quality was reported for is unknown. Information on the duration of the specific friendship has also not been assessed, although this could influence the quality of the relationship. Thus, potential differences in friendship dynamics and quality between same and other gender friendships or new and long-term friendships could not be considered (Hartup & Stevens, 1997). Also, participants could report on different friends at different assessments.

CONCLUSION

We documented, for the first time, that exposure to maternal depressive symptoms in early childhood has long-term downstream associations with adolescent friendship quality, an aspect of children's development that is crucial for their future well-being. Children's social skills at age 7 emerged as a key path through which maternal depressive symptoms were associated with children's poorer socioemotional development. These findings contribute to our understanding of how maternal mental health problems can affect children's development beyond the mental health domain and deserves increased attention when considering ways to support families affected by parental mental illness. It is possible that targeted efforts are needed to ensure that children who live with a parent suffering from depressive symptoms receive additional support in building social skills and competence. Supporting mothers' mental health and promoting children's social skills not only increase personal well-being and productive development but could also break the intergenerational circle of social difficulties.

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TABLE 1 Descriptives and correlations of main variables and covariates

Variables	*N*	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1) Maternal depr. sympt. (ages 2–5)	405	0.61	0.03	--													
2) Negative parenting (age 7)	301	3.15	0.54	.14+	--												
3) Negative parenting (age 10)	285	3.46	0.50	.13	**.45*****	--											
4) Social skills (age 7)	274	1.39	0.34	**–.30****	**-.19****	-.06	--										
5) Social skills (age 10)	275	1.44	0.34	**–.19****	-.12	-.02	**.56*****	--									
6) Friendship quality (age 7)	249	2.63	0.60	.03	.08	**.15***	.12+	**.15***	--								
7) Friendship quality (age 10)	301	2.99	0.50	–.14+	-.01	-.07	**.30*****	**.19****	**.28*****	--							
8) Child depr. sympt. (age 7)[1]	204	0.29	0.23	**.22***	.09	.07	–.12	–.15+	**–.23****	–.03	--						
9) Child depr. sympt. (age 10)	286	0.22	0.24	**.19***	.04	-.00	**–.28****	**–.24****	–.04	**–.17****	**.35*****	--					
10) Friendship quality (age 15)	288	2.90	0.59	**–.15***	**-.13***	-.09	**.29*****	**.23****	**.23****	**.39*****	–.03	–.05	--				
11) Sex (1= male)	443	0.48	0.50	.03	-.06	-.04	**–.16***	**–.17****	**–.25***	**–.28****	.09	–.06	**–.38****	--			

									**	*			*			
12) SES	423	39.61	11.13	**–.19****	**-.27****	**-.17****	**.12***	.11+	-.01	.01	**–.15***	**–.18****	.02	.09+	--	
					*											
13) Race/ethnicity (1=Non-White)	443	0.32	0.47	.03	**.38****	**.22****	**–.20****	**–.15***	**.13***	–.04	**.20****	.06	–.11+	–.02	**–.21****	--
					*	*									*	
14) Single motherhood (age 2)	424	0.19	0.39	**.14***	**.40****	**.25****	**–.25****	**–.15***	.12+	–.01	.05	.10+	.05	–.09+	**–.35****	**.38*****	--
					*	*	*								*		
15) Externalizing (age 2)	400	51.94	9.30	**.44*****	**.13***	.02	**–.29****	**–.25****	–.05	–.09	**.19****	**.20****	–.05	.08	**–.17****	–.01	**.11***
							*	*									

Note: Depr. sympt. = depressive symptoms. The N differs for different constructs at the same time-point because of different informants (child-report, teacher-report, and observed parenting behavior). For maternal depressive symptoms, M and SD represent the latent mean and standard error from latent mean, respectively. [1]Only assessed in two of three cohorts. For the correlations with the latent maternal depressive symptoms factor, the correlation for each variable with the latent factor was specified in a separate model using robust maximum likelihood estimation and full information maximum likelihood procedures for missing data. *$p < .05$; **$p < .01$; ***$p < .001$

Table 2. Unstandardized coefficients and their bias-corrected bootstrap confidence intervals and standardized estimates of final path model.

	Adjusted model			
		95% CI		
	Estimate	**Lower bound**	**Upper bound**	**Standardized Estimate**
Latent factor loadings				
Maternal depressive symptoms				
Age 2	**1.00**	--	--	--
Age 4	**1.50**	1.08	2.15	0.85
Age 5	**1.58**	1.16	2.13	0.86
Regressions				
Negative parenting behavior age 7				
Maternal depressive symptoms	0.10	-0.12	0.36	0.06
SES	-0.01	-0.01	0.00	-0.12
Race (non-White=1)	**0.29**	0.14	0.44	0.24
Single motherhood	**0.40**	0.21	0.60	0.28
Social skills age 7				
Maternal depressive symptoms	**-0.18**	-0.37	-0.02	-0.17
Sex (male=1)	**-0.11**	-0.19	-0.04	-0.17
Single motherhood	**-0.18**	-0.28	-0.08	-0.21
Externalizing symptoms	**-0.01**	-0.01	-0.00	-0.19
Child depressive symptoms age 7				
Maternal depressive symptoms	0.11	-0.02	0.30	0.15
Race (non-White=1)	**0.10**	0.03	0.18	0.20
Externalizing symptoms	**0.00**	0.00	0.01	0.16
Friendship quality age 7				
Maternal depressive symptoms	0.07	-0.19	0.29	0.04
Sex (male=1)	**-0.25**	-0.40	-0.10	-0.21
Race (non-White=1)	**0.18**	0.02	0.34	0.14
Negative parenting behavior age 10				
Negative parenting behavior age 7	**0.38**	0.22	0.51	0.43
Social skills age 7	0.01	-0.17	0.20	0.01
Child depressive symptoms age 7	0.13	-0.24	0.48	0.07
Friendship quality age 7	**0.12**	0.00	0.23	0.14
Social skills age 10				
Negative parenting behavior age 7	-0.04	-0.11	0.04	-0.06
Social skills age 7	**0.57**	0.46	0.69	0.57
Child depressive symptoms age 7	-0.12	-0.34	0.08	-0.09
Friendship quality age 7	0.01	-0.07	0.09	0.02
Child depressive symptoms age 10				
Child depressive symptoms age 7	**0.37**	0.20	0.54	0.35
Negative parenting behavior age 7	-0.05	-0.10	0.01	-0.10
Social skills age 7	**-0.23**	-0.34	-0.12	-0.31

Friendship quality age 7	0.04	-0.02	0.11	0.09
Sex (male=1)	-0.05	-0.10	0.01	-0.09
Friendship quality age 10				
Friendship quality age 7	**0.18**	0.07	0.29	0.22
Negative parenting behavior age 7	-0.01	-0.12	0.11	-0.01
Social skills age 7	**0.32**	0.11	0.52	0.22
Child depressive symptoms age 7	0.10	-0.22	0.40	0.05
Sex (male=1)	**-0.19**	-0.31	-0.08	-0.19
Friendship quality age 15				
Maternal depressive symptoms	-0.17	-0.42	0.07	-0.09
Friendship quality age 10	**0.31**	0.13	0.50	0.26
Negative parenting behavior age 10	-0.04	-0.23	0.13	-0.04
Social skills age 10	0.17	-0.08	0.41	0.10
Child depressive symptoms age 10	0.15	-0.15	0.46	0.07
Sex (male=1)	**-0.33**	-0.48	-0.16	-0.28
Maternal depressive symptoms				
Externalizing symptoms	**0.02**	0.01	0.02	0.44
Covariances				
Social skills age 7 and				
Negative parenting behavior age 7	-0.01	-0.03	0.01	-0.07
Child depressive symptoms age 7	-0.00	-0.01	0.01	-0.05
Friendship quality age 7	**0.03**	0.00	0.05	0.14
Child depressive symptoms age 7 and				
Negative parenting behavior age 7	0.01	-0.01	0.02	0.04
Friendship quality age 7	**-0.04**	-0.06	-0.01	-0.26
Friendship quality age 7 and				
Negative parenting behavior age 7	0.00	-0.05	0.04	0.01
Social skills age 10 and				
Negative parenting behavior age 10	0.01	-0.01	0.03	0.09
Child depressive symptoms age 10	-0.01	-0.02	0.00	-0.09
Friendship quality age 10	0.01	-0.01	0.03	0.06
Child depressive symptoms age 10 and				
Negative parenting behavior age 10	-0.01	-0.02	0.01	-0.05
Friendship quality age 10	**-0.02**	-0.04	-0.00	-0.19
Friendship quality age 10 and				
Negative parenting behavior age 10	-0.02	-0.05	0.00	-0.11

Note. Significant coefficients are bolded. Control variables vary for the different endogeneous variables because covariates were omitted from the final model when p >.10.

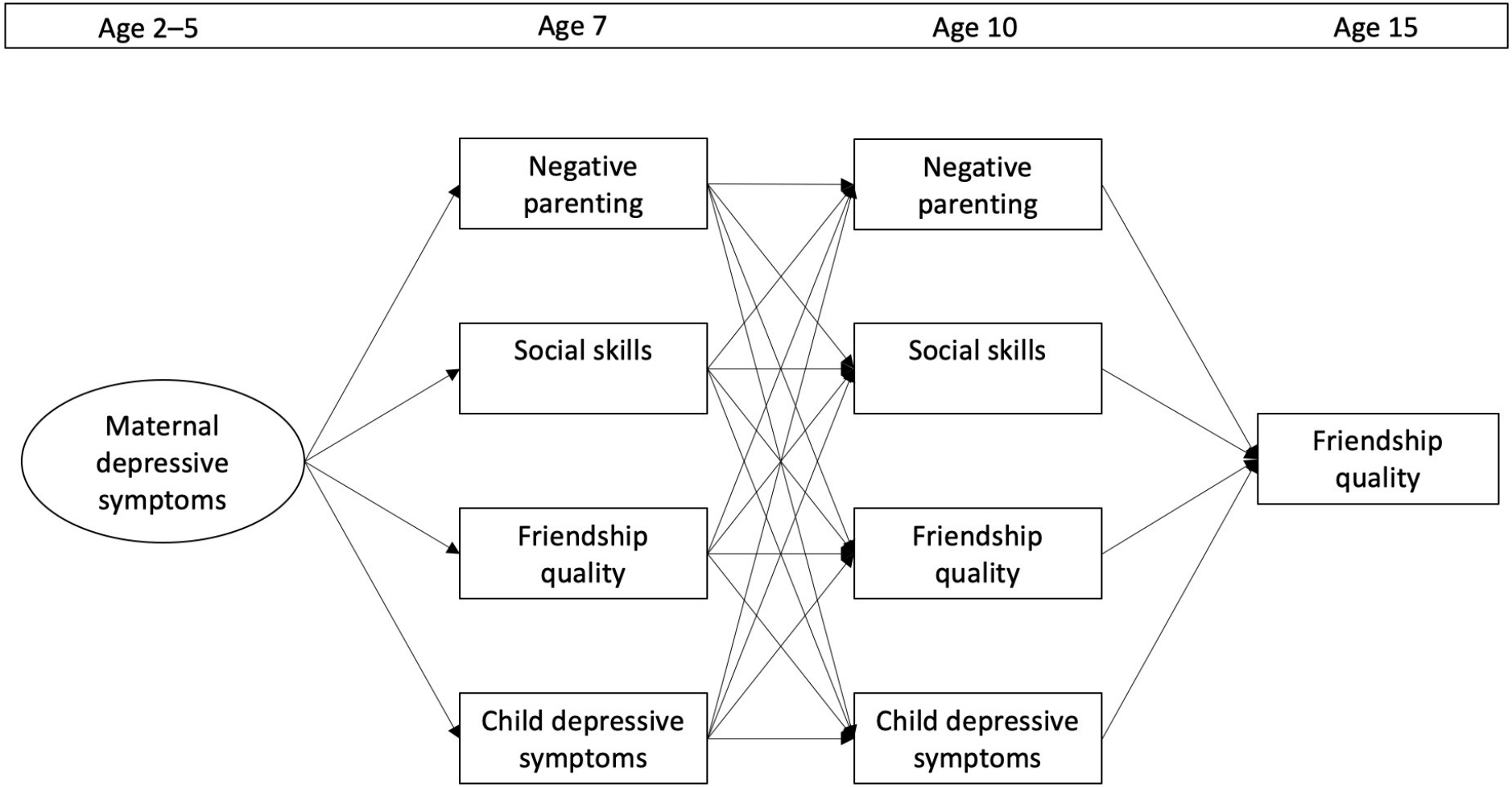

FIGURE 1 Hypothesized developmental cascades from maternal depressive symptoms in early childhood to adolescent friendship quality. Covariances between constructs assessed at the same point in time and a direct path

from maternal depressive symptoms to friendship quality at age 15 were also estimated, but not shown in the figure for ease of reading.

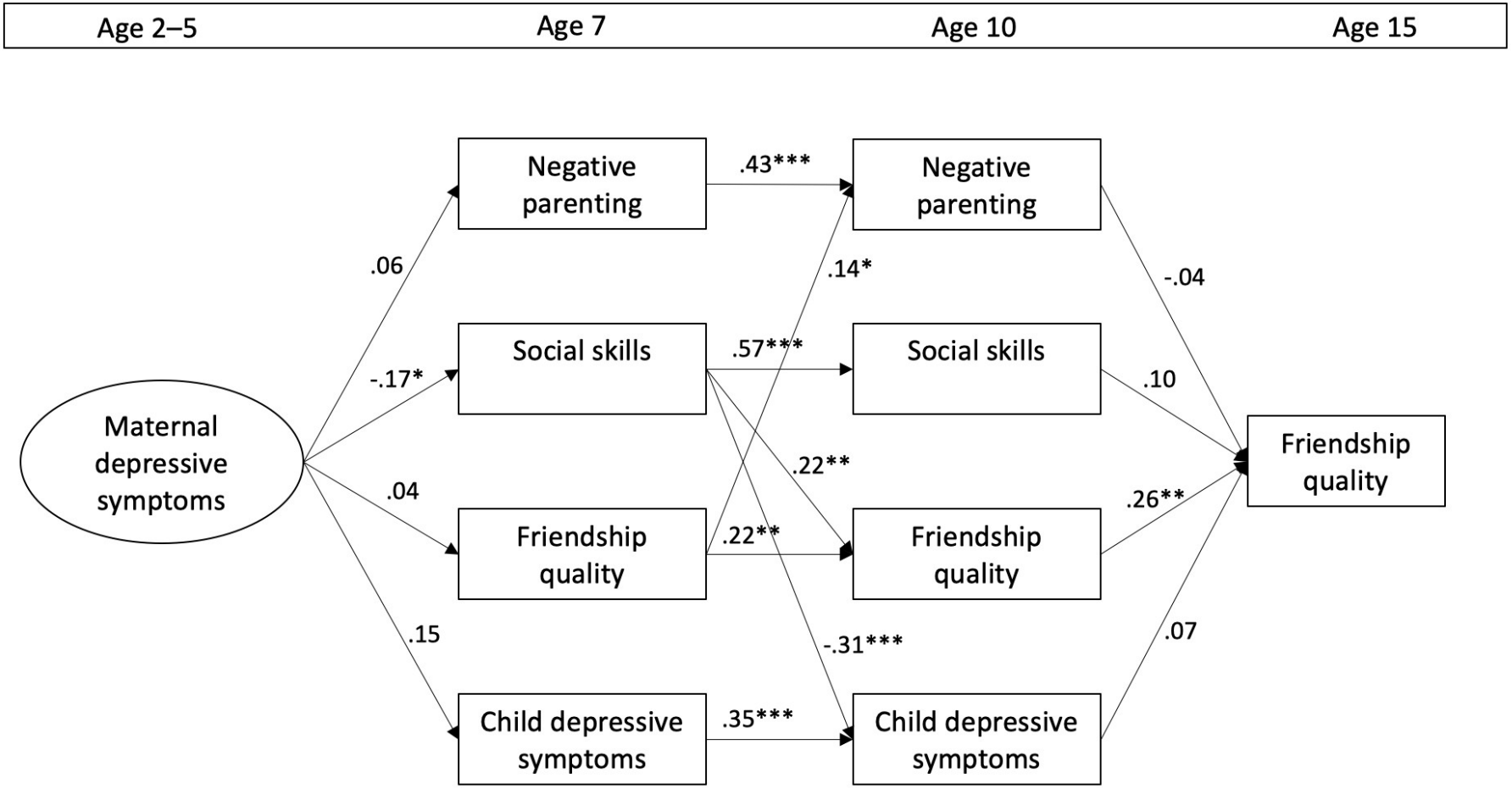

FIGURE 2 Standardized coefficients of the final model (χ^2 (*df*) = 77.24 (72), *p* =.315; CFI = .99; RMSEA = 0.01; SRMR = 0.04). For ease of reading, only significant cross paths from constructs assessed at age 7 to constructs assessed at age 10 are presented in the figure. Covariances between constructs assessed at the same point in time and a direct path from maternal depressive symptoms to friendship quality at age 15 were also included in the model, but not shown in the figure for ease of reading. All unstandardized coefficients and confidence intervals,

including the retained covariates, are presented in Table e2 of the online Supplement. *$p < .05$; **$p < .01$; ***$p < .001$