The role of fathers' versus mothers' parenting in emotion-regulation development from mid-late adolescence: Disentangling between-family differences from within-family effects

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Abstract

This four-year, multi-informant longitudinal study (N=480, initial age: 15) investigated the interplay between parental support, behavioral- and psychological control, and adolescents' emotion regulation development. We examined reciprocal effects between parents and children, mothers' versus fathers' unique roles in emotion regulation development, and sex differences. Multi-informant data allowed us to compare effects of adolescent-perceived and parent-reported parenting. Finally, innovative analyses allowed us to disentangle between-family differences from within-family predictive processes. Parenting and emotion regulation were associated at the between-family and within-family levels, especially according to adolescent reports. Support primarily played a role between mothers and adolescents, and perceived behavioral control between fathers and adolescents. Sex moderation revealed that support played a more prominent role in mother-daughter than mother-son relationships, and that daughters experienced greater behavioral control. Child effects outnumbered parent effects, which might reflect the increasing equality of adolescent-parent relationships. Finally, adolescent-perceived parenting was a stronger correlate of emotion regulation than parent-reports, suggesting that adolescents' perceptions are a relevant source of information for research and practice. Consistent with the self-determination theory perspective on parenting, emotion regulation flourished when adolescents felt like mothers provided support, and fathers loosened behavioral control. These results are in line with the notion that mother-child relationships are supportive attachment relationships, whereas fathers provide "activation" relationships, challenging adolescents to regulate emotions autonomously by providing less explicit structure.

Keywords: emotion regulation; socialization; adolescence; random intercept cross lagged panel model; longitudinal

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Emotion regulation refers to the processes involved in modulating, understanding, and accepting emotional responses, which enable individuals to act in goal-oriented ways, and meet situational demands, despite their emotional states (Gratz & Roemer, 2004). This ability is essential for positive psychosocial adjustment and mental health (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Recently, there has been a call for research to examine parents' role in emotion regulation development in adolescence (Bariola, Gullone, & Hughes, 2011). This is especially relevant, because adolescence is a developmentally sensitive period for the neural circuitry underlying mature emotion regulation. During this period of synaptic reorganization, adolescents' regulatory abilities temporarily decrease (Zimmermann & Iwanski, 2014), precisely at a time when hormonal changes render adolescents more responsive to emotional cues (Somerville, Jones, & Casey, 2010). It is therefore important to investigate what role, if any, parents still play in adolescents' emotion regulation development.

The present study aimed to answer this call by studying the predictive interplay between specific parenting behaviors and emotion regulation from mid- to late-adolescence. We sought to contribute to the current understanding of parents' socialization of emotion-regulation in several ways. Firstly, we examined bi-directional effects between parents and children. According to the interactional view of parenting, families are dynamic systems in which members exert reciprocal influences (Kerr, Stattin, & Özdemir, 2012). Children's predictive influence on parenting behaviors increases in adolescence (Meeus, 2016), as relationships with parents become more egalitarian when children mature (Branje, Laursen, & Collins, 2013). Secondly, we examined mothers' and fathers' potentially unique influences, thereby moving beyond prior research which

focused primarily on mothers. In the fatherhood literature, emotion socialization is hypothesized to be a domain in which fathers play a unique role (Paquette, 2004). Therefore, we investigated to what extent fathers play a different role from mothers. We also examined adolescent sex moderation, because boys and girls are raised differently, and might be differentially affected by parenting behaviors (Keizer, Lucassen, Jaddoe, & Tiemeier, 2014; Seiffge-Krenke & Pakalniskiene, 2011). Thirdly, we compared patterns of results for adolescent perceptions of parenting, and parental self-reports. Although parents' and children's perspectives on their relationship tend to diverge in adolescence (Van Lissa, Hawk, Branje, et al., 2014), most studies focus on single informants, or aggregate dual-informant reports (De Los Reyes & Kazdin, 2005). Finally, we used innovative techniques to disentangle stable differences *between* families from predictive links between parenting and children's outcomes *within* families (Hamaker, Kuiper, & Grasman, 2015).

Parents' role in adolescents' emotion regulation development

According to the self-determination theory of parenting (Joussemet, Landry, & Koestner, 2008), parents face the challenge of teaching children how to function effectively within the family and society at large, whilst at the same time nurturing children's fundamental need for autonomy. This challenge is particularly relevant in adolescence, when parent-child relationships gradually become less hierarchical and more horizontal (Branje et al., 2013). Whereas younger children require substantial parental guidance in emotion regulation (Morris, Silk, Steinberg, Myers, & Robinson, 2007; Thompson & Meyer, 2007), adolescents will likely benefit more when parents support their ability to manage emotional difficulties autonomously (Sarıtaş, Grusec, & Gençöz, 2013). However, according to the notion of developmental timetables, parents are often still concerned with instilling proper values in their children, even

when it comes to issues which adolescents view to be personal (Deković, Noom, & Meeus, 1997). Parents' desire to raise children well might thus motivate them to respond proactively to adolescents' emotional dysregulation, just like they would do in childhood. Adolescents, in turn, can perceive parental involvement as a threat to their growing autonomy needs (Allen & Manning, 2007). Consequently, distressed adolescents might pull away from parents, rather than turning to them for support. If parents do exercise control in domains which adolescents perceive to be personal, such as adolescents' emotional experiences, parental efforts are likely to backfire, leading to further emotional distress (Meeus, 2016; Smetana & Daddis, 2002). The literature thus suggests that adolescents' increasing autonomy needs can sometimes be at odds with parents' desire to raise children well.

Mechanisms of parental influence

One way in which parents are thought to contribute to emotion regulation development is through specific parenting behaviors (Morris et al., 2007). Three parenting dimensions which have been considered particularly relevant for emotion regulation socialization (e.g., Kerr et al., 2012) are support, behavioral control, and psychological control. These three dimensions constitute the underpinnings of the parenting styles taxonomy (Barber & Harmon, 2002; Baumrind, 1991; Maccoby & Martin, 1983). Support refers to parental warmth and responsiveness to the adolescents' needs. Behavioral control refers to the structure parents provide through rule setting, and attempts to regulate children's behaviors to conform to social or family norms. Psychological control, on the other hand, refers to intrusive, passive-aggressive parenting behaviors, such as invalidating the child's feelings and opinions, guilt induction, and blaming the child (Barber & Harmon, 2002). Each of these parenting dimensions will likely have different associations with adolescents' emotion regulation development.

There is a strong theoretical link between parental support and children's emotion regulation development. Baumrind (1991, p. 62) defined responsiveness, which is akin to support, in terms of actions which "intentionally foster individuality, *self-regulation* and self-assertion by being attuned, supportive and acquiescent to the child's special needs and demands" (emphasis ours). A large body of research has validated this conceptual association (for reviews, see Eisenberg, Cumberland, & Spinrad, 1998; Morris et al., 2007). For example, longitudinal research has shown that adolescent-perceived support predicted over time change in two constructs related to emotion regulation: increasing coping (Seiffge-Krenke & Pakalniskiene, 2011), and decreasing internalizing symptoms (Van der Giessen, Branje, & Meeus, 2014). This suggests that support might positively predict emotion regulation development as well.

Behavioral control reflects the standards parents set, which require adolescents' self- and emotion regulation to live up to (Baumrind, 1991; Stattin & Kerr, 2000). The structure provided by parental control benefits young children's emotion regulation development (Morris et al., 2007). Adolescents' tolerance for such control might diminish over time, however: According to social domain theory, parents' and children's perspectives regarding legitimate parental authority change, as adolescents' conceptualization of the personal domain expands (Smetana & Daddis, 2002). Moreover, according to the notion of developmental timetables, adolescents' expectations of increased autonomy precede parents' readiness to grant it (Deković et al., 1997). Parental behavioral control might thus frustrate adolescents' autonomy needs. Indeed, adolescents' perceptions of being controlled have been linked with both internalizing and externalizing problems (Meeus, 2016; Stattin & Kerr, 2000), suggesting they might also negatively predict emotion regulation development. Conversely, adolescents' emotion regulation might increase when parents gradually relinquish behavioral control, granting adolescents legitimate autonomy.

Whereas behavioral control provides a clear structure for adolescents' appropriate behavior, psychological control is, by definition, more intrusive (Barber & Harmon, 2002; Soenens & Vansteenkiste, 2010). It involves internally controlling strategies, which directly frustrate adolescents' autonomy needs –invalidation of the child's point of view, love withdrawal, guilt-induction, shaming, and anxiety induction (Soenens & Vansteenkiste, 2010). Psychological control has been consistently linked with adolescents' internalizing problems (Barber & Harmon, 2002; Morris et al., 2002; Soenens & Vansteenkiste, 2010), which suggests that it would also be associated with emotion regulation difficulties.

Child effects on parenting

According to the transactional view of family relationships, there are reciprocal influences between parents' and children's behavior (Kerr et al., 2012). An important challenge for parents of adolescents is to strike a balance between age-appropriate control and autonomy granting (Smetana & Daddis, 2002). Studies on mean-level changes in adolescent-parent relationships show that parental control and support decrease, and conflict first peaks and then decreases, as adolescents and parents adjust to their relationship's increasing equality (Barber, Maughan, & Olsen, 2005; Meeus, 2016). Within individual families, however, such changes in parenting might be contingent on children's tendency to exhibit age-appropriate adjustment. Parents increasingly expect maturing children to regulate their emotions autonomously (Dix, 1991). If adolescents meet this expectation, parents might grant autonomy by reducing control and providing support. Conversely, if they fall short of this expectation, parents might shift from supportive towards more controlling parenting. Indeed, cross-sectional research found that parents were less supportive, and more punitive towards negative emotion displays by older adolescents than by younger adolescents (e.g., Klimes-Dougan et al., 2007). Longitudinal

research found that early adolescents' adaptive emotion regulation in conflict discussions with mothers predicted decreasing maternal behavioral control from early- to late-adolescence (Van der Giessen, Branje, Keijsers, et al., 2014). Similarly, a two-year longitudinal study found that adolescents' difficulties in emotion regulation predicted decreasing support and increasing psychological control (Otterpohl & Wild, 2015). These findings suggest that parents respond to adolescents' emotion regulation difficulties by decreasing support and increasing behavioral and psychological control, whereas adaptive emotion regulation might elicit the opposite response.

Mothers' and fathers' roles in emotion regulation development

The notion that mothers and fathers play different roles in socialization hails back to attachment theory (see Lamb & Lewis, 2013). According to Paquette (2004), the "attachment relationship", rooted in parents' tendency to comfort children in stressful situations, best characterizes mother-child relationships. Relationships with fathers, on the other hand, are construed as an "activation relationship": Fathers encourage children to take risks and overcome obstacles, which opens children to the world, teaches them obedience, and develops their socio-emotional skills (Majdandžić, Möller, de Vente, Bögels, & van den Boom, 2014; Paquette, 2004). Through rough-and-tumble play, for example, fathers provide unpredictable emotional stimuli, expanding children's emotional repertoire (Lamb & Lewis, 2013). Emotion socialization is thus considered to be a domain in which fathers might play a unique role, at least in childhood (Paquette, 2004). Whether mothers and fathers continue to contribute in unique ways to adolescents' emotion regulation development remains to be examined, as most studies on adolescents have focused on mothers, exclusively (Bariola et al., 2011).

Studies on middle- and late childhood support the notion that mothers and fathers continue to play unique roles in emotion regulation development beyond early childhood. For

example, when asked about their responses to children's emotion expressions, mothers reported being more likely to encourage sadness expressions and respond constructively, whereas fathers reported being more likely to minimize the problem or encourage inhibition (Cassano, Perry-Parrish, & Zeman, 2007). Compared to mothers, fathers also responded more punitively to their children's displays of emotions, particularly vulnerable emotions like sadness and fear (e.g., Eisenberg et al., 1999). In terms of children's outcomes, fathers' controlling behavior was found to be a more consistent predictor of children's social competence than supportive behavior, whereas this pattern was reversed for mothers (McDowell, Parke, & Wang, 2003). In adolescence, too, relationships with mothers tend to be closer, whereas fathers are viewed as authority figures (Branje et al., 2013; Klimes-Dougan et al., 2007; Lamb & Lewis, 2013). We might thus expect support to play a stronger role in adolescents' relationships with mothers, and control to play a stronger role in relationships with fathers. In line with the distinction between the attachment- versus activation relationship (Paquette, 2004), this suggests that support is a more salient socialization mechanism for mothers, whereas control is more salient for fathers.

Differences between sons and daughters

It is also important to consider the potential moderating role of adolescents' sex. First of all, adolescent girls typically report greater difficulties in emotion regulation than boys (Silk, Steinberg, & Morris, 2003). Secondly, parents raise boys and girls differently (Seiffge-Krenke & Pakalniskiene, 2011), granting more autonomy to boys, and exercising greater control over girls (e.g., Pomerantz & Ruble, 1998; Smetana & Daddis, 2002). Thirdly, boys and girls might be differently affected by parenting (Keizer et al., 2014). For example, according to social learning theory, the same-sex parent plays a stronger role in a child's development (Bussey & Bandura, 1999). However, some studies suggest that children's relationships with mothers are closer than

with fathers (Klimes-Dougan et al., 2007), and that mother-daughter relationships are closest of all (Branje et al., 2013). Mothers express greater support towards daughters than sons (Leaper, Anderson, & Sanders, 1998), and girls are more sensitive to the affective family environment (Denham, Mitchell-Copeland, Strandberg, Auerbach, & Blair, 1997). We might thus expect mothers to provide greater support to girls, and girls to be more influenced by this than boys.

Adolescent perceptions versus parental self-reports

Although using multi-informant data is widely encouraged, reporter discrepancies are rarely considered (De Los Reyes & Kazdin, 2005). In adolescence, parents' and children's perspectives on their relationship tend to diverge temporarily (Branje et al., 2013; Van Lissa, Hawk, Branje, et al., 2014). According to the intergenerational stake hypothesis, parents are more emotionally invested in this relationship, and project more positive feelings, whereas children desire independence, and are thus invested in enhancing differences (Bengtson & Kuypers, 1971). Developmental research indeed bears out that, relative to children, parents tend to have a more optimistic view of their own childrearing behaviors (Bögels & Melick, 2004). Moreover, adolescents' ratings of maternal support and control correlated more strongly with objective trained observers' ratings than mothers' self-reports (Gonzales, Cauce, & Mason, 1996). This suggests that adolescents' perceptions of parenting are a valid and important source of information, which might have implications for adolescents' adjustment above and beyond parents' self-reported control. In support of this, over-time predictive links from parent-reported control to adolescents' maladjustment were mediated by adolescents' perceptions of being over-controlled (Kakihara, Tilton-Weaver, Kerr, & Stattin, 2009). It is hard to say, of course, whose perspective is objectively "right": More important is to consider which respondent's reports are most strongly predictive of adolescents' emotional adjustment.

Growing evidence suggests that parent-reported parenting is less strongly associated with covert aspects of wellbeing than with overt aspects: Compared to adolescent-perceived parenting, parents' reports predicted emotional functioning poorly, but predicted academic achievement equally well (Cheung, Pomerantz, Wang, & Qu, 2016). Parents might be poorly informed about adolescents' emotional wellbeing, because teens desire increasing autonomy, and are more inclined to share emotional troubles with friends than with parents (Ackard, Neumark-Sztainer, Story, & Perry, 2006). Consequently, it has been argued that researchers should examine both adolescent- and parent-reports, rather than aggregating them (De Los Reyes & Kazdin, 2005). Parents' and children's perceptions of socialization practices are likely to differ, and adolescents' perceptions of parenting might hold predictive power for their emotional adjustment, above and beyond parents' self-reports.

Between-family differences versus within-family processes

Many developmental studies aim to provide insight into the effect of parents' child rearing behaviors on their own children's emotion regulation. When authors translate their findings into recommendations for parents and practitioners, this reveals a tacit assumption that their results reflect *within-family* (causal) *processes*. However, many methods do not disentangle processes within families from stable differences *between families*. Cross-lagged panel models, for example, have recently come under considerable scrutiny, because their over-time predictive effects can be substantially biased, or even spurious, if stable differences between families are unaccounted for (Hamaker et al., 2015). If one can show that, *within families*, a change in parents' behavior preceded a change in their children's outcomes, a stronger case can be made about effects parents might have on their own children (or vice versa). This is accomplished using the recently developed random-intercept cross-lagged panel model (Hamaker et al., 2015).

Inspired by multilevel modeling, this technique splits the variance in individuals' responses into a) stable between-family differences, and b) within-family fluctuations. At the between-family level, this model answers questions such as: "Do mothers who are, on average, more supportive than other mothers have children with, on average, better emotion regulation than other children?" Correlations at the between-family level can reflect, for example, the "crystallized" effect of parenting at an earlier age, or the influence of third variables that affect both parenting and children's outcomes. At the within-family level, the model examines predictive effects, addressing questions such as "If a father displays relatively more behavioral control than he usually does in one year, does his child display relatively lower emotion regulation in the next year?" Traditional approaches often conflate these two levels, and disentangling them provides a more nuanced understanding of the links between parenting and emotion regulation.

The Present Study

This four-year longitudinal study set out to investigate links between parenting behaviors and emotion regulation from mid to late adolescence, both in terms of correlations of stable differences between families, and predictive effects within families. Taking an interactional perspective, we examined both parents' effects on children's emotion regulation, and child effects on parenting. We investigated potentially unique roles of mothers and fathers, and the role of adolescent sex in terms of mean-level differences and as a moderator of levels of – and associations between – parenting and emotion regulation. This also allowed us to account for sex differences in emotion regulation, as prior research found that girls reported lower levels of emotion regulation than boys. Based on the literature, we formulated the following hypotheses.

Support. We expected parental support to be positively associated with adolescents' emotion regulation at the between- and within-family levels, and both in terms of parenting

effects and child effects. We hypothesized links between support and emotion regulation to be stronger for mothers than for fathers. We further expected to find higher levels of support, and stronger associations between support and emotion regulation, between mothers and daughters than between mothers and sons.

Behavioral control. We hypothesized that behavioral control would be negatively associated with emotion regulation at the between- and within-families levels, and both in terms of parenting effects and child effects. We hypothesized that these links would be stronger for fathers than for mothers. We expected behavioral control to be higher for girls than boys.

Psychological control. We hypothesized that psychological control would be negatively associated with emotion regulation at the between- and within-families levels, and both in terms of parenting effects and child effects. We predicted to find greater psychological control for girls than boys.

As both adolescents and parents reported on support and behavioral control, we were able to examine and compare how adolescent-perceived and parent-reported parenting related to emotion regulation. However, the third parenting dimension, psychological control, was reported by adolescents only. For both support and behavioral control, we hypothesized that links between parenting and emotion regulation would be stronger for adolescent-perceived parenting, than for parent-reported parenting.

Methods

Participants

Participants were 480 adolescents (273 boys; age at T1: M =15.04, SD = 0.46), and their parents (475 mothers and 436 fathers), enrolled in the longitudinal [masked] study [masked reference]. All adolescents were [northern-European nation] nationals, although a minority

(4.28%, 1 missing) indicated having a different ethnic background. Based on parents' reports of employment status, most of adolescents' families were classified as medium- to high-SES (10% low-SES).

Procedure and design

[masked] was approved by the medical ethical committee of the University Medical Center [masked]. Participants were recruited from randomly selected schools in the province of [masked], and four main cities in [masked]. Of 1,081 families contacted, 470 refused and 114 failed to produce informed consent. From 2008 to 2012, trained interviewers conducted four annual home visits to collect data on adolescents' self-reported difficulties in emotion regulation and perceived parental support, behavioral control, and psychological control. Families received financial compensation for their participation in annual measurements (€100).

Measures

Emotion regulation. Emotion regulation was reported by adolescents, using the reverse-coded 32-item difficulty in emotion regulation scale (e.g., "When I'm upset, I have difficulty thinking about anything else", Gratz & Roemer, 2004). Responses ranged from 1 ("Almost never") to 5 ("Almost always"). This scale distinguishes six aspects of difficulties in emotion regulation, including lack of emotional awareness, lack of emotional clarity, impulse behavioral control difficulties, difficulties engaging in goal-directed behavior, non-acceptance of emotional responses, and limited access to emotion regulation strategies. Reliability analyses indicated that the emotional awareness items correlated low or negatively with the total scale, and diminished reliability. Similarly, exploratory factor analyses with Oblimin rotation indicated that two factors explained most of the item variance, with the first factor containing all items except those related to lack of emotional awareness, and the second factor containing all items related to lack of

emotional awareness. We therefore omitted the emotional awareness subscale from further analyses. Together, the remaining items had excellent reliability, αs .94 - .95.

Support. Adolescents rated perceived support from mothers and fathers separately, and parents provided self-reports of support provided, using the eight-item Support subscale of the Network of Relationships Inventory (e.g., "Does your mother/father admire and respect you?", Furman & Buhrmester, 1985). Responses ranged from 1 ("Not at all") to 5 ("Very much"). Reliability ranged from good to excellent for adolescent-perceived support from mothers and fathers, αs .83 - .89, and ranged from acceptable to good for parent-reported support, αs .72 - .80.

Behavioral control. Adolescents rated perceived parental behavioral control for mothers and fathers separately, and parents provided self-reports of control, using the five-item Parental Behavioral control subscale of the Parenting Practices questionnaire (e.g., "Do you need permission from your mother/father to come home late on a weekday?", Stattin & Kerr, 2000). Responses ranged from 1 ("Never") to 5 ("Always"). Reliability ranged from good to excellent for both adolescent-perceived control, αs .85 - .91, and for parent-reported control, αs .85 - .89.

Psychological control. Adolescents rated psychological control for both parents using the eight-item psychological control Scale (e.g., "My mother/father always tries to change my thoughts and feelings." Barber & Harmon, 2002). Responses ranged from 1 ("Not applicable at all") to 5 ("Very applicable"). Reliability ranged from good to excellent, αs .85 - .90.

Strategy of analyses

Descriptive statistics are presented in Table 1, and a correlation matrix is presented in Supplementary Table S1. All analyses were conducted in Mplus Version 7.4 (Muthén & Muthén, 1998-2012). Per the developers' recommendation, we used robust maximum-likelihood estimation. Attrition ranged from 9.26% in the first wave, to 14.26% in the last wave. Data were

missing completely at random, Jamshidian and Jalal's non-parametric MCAR test $p = .39$. As covariance coverage exceeded the minimum of .10 (range: .76 - .95), full information maximum likelihood estimation (FIML) was warranted to make use of all available information without estimating missing data. Mean scores were calculated for each scale; see Appendix A for zero-order correlations between the study variables. To evaluate model fit, we considered Root Mean Square Error of Approximation (RMSEA) < .05, and comparative fit index (CFI) and Tucker-Lewis Index > .95, to indicate good fit (Little, 2013). We also provide two comparative fit indices, for which lower values indicate better fit: The Akaike Information Criterion (AIC) and sample-size adjusted Bayesian Information Criterion (aBIC).

Model building. We used the random intercept cross-lagged panel model (Hamaker et al., 2015) to investigate associations between parenting behaviors and adolescents' emotion regulation at the between- and within-family levels. For reference, a two-variable, four-wave version of this model is presented visually in Figure 1. In the present study, this model was extended to three variables. To maintain an acceptable parameter-to-N ratio (Little, 2013), we conducted analyses separately for the three parenting behaviors. We compared the following models: First, we estimated a traditional cross-lagged panel model. Second, we constrained all autoregressive and cross-lagged regression coefficients and within-time correlations over time, which increases degrees of freedom, and aids interpretability. In all cases, this led to improved model fit, indicating these constraints were defensible. Third, we extended the cross-lagged panel models to random-intercept cross-lagged panel models. Improved model fit indices indicated that accounting for stable between-family differences was defensible. Fourth, we used multi-group models to test sex moderation, and freed al structural model parameters between boys and girls. Fifth, based on Wald χ^2-tests, we constrained all parameters that did not differ

significantly between boys and girls to be equal. All final models showed good fit according to all indices, and AIC and aBIC showed a steady decline from each model to the next (see Tables 2 and 3 for models of adolescent-perceived and parent-reported parenting, respectively). To test our hypotheses about differences between mothers and fathers, we used Wald tests to compare parameters between mothers versus fathers.

Results

All results are graphically depicted in Figure 2 (adolescent-perceived parenting), and Figure 3 (parent-reported parenting), and clarified in the text below.

Support

Adolescent-perceived support. At the between-family level, the intercepts of adolescent-perceived maternal and paternal support were both positively correlated with the intercept of emotion regulation (see Figure 3). This means that, as hypothesized, adolescents who reported higher levels of parental support also reported higher levels of emotion regulation than adolescents who perceived lower levels of parental support. This correlation was significantly stronger for fathers' support than mothers' support, $\chi^2(1) = 3.87$, $p < 0.05$. Finally, in line with hypothesized sex differences, the mean intercept of maternal support was significantly higher for girls than boys, indicating that girls reported receiving more maternal support than boys, $\chi^2(1) = 40.90$, $p < 0.001$. Between-family level correlations did not differ between boys and girls.

Within families, we found predictive effects between emotion regulation and adolescent-perceived maternal, but paternal, support. In line with our hypothesis that these effects would be strongest between mothers and daughters, perceived maternal support positively predicted girls', but not boys', emotion regulation $\chi^2(1) = 8.60$, $p < 0.01$. This means that, when girls perceive

more maternal support than usual, they report increased emotion regulation one year later. Regarding child effects, emotion regulation positively predicted maternal support for both sexes.

Parent-reported support. At the between-family level, only maternal support was significantly positively correlated with emotion regulation (see Figure 3). Moreover, in line with predicted sex differences, the mean intercept of maternal support was higher for girls than for boys, indicating that mothers provided more support to daughters, $\chi^2(1) = 11.48$, $p < 0.001$.

Within-families, there were no significant predictive effects between parent-reported support and emotion regulation. There was, however, a bi-directional interplay between parents, indicating that they followed each other's lead in terms of the support they provided to children.

Behavioral control

Adolescent-perceived behavioral control. At the between-family level, we found no evidence for the hypothesized negative associations between adolescent-perceived control and emotion regulation. However, in line with predicted sex differences, the mean intercepts of behavioral control from both mothers and fathers were significantly greater for girls than for boys, $\chi^2(1) = 15.09$, $p < 0.001$, and $\chi^2(1) = 4.39$, $p = 0.04$, respectively.

Within families, effects were in line with hypotheses. There were negative effects from behavioral control to emotion regulation for fathers, but for mothers. Adolescents' emotion regulation, in turn, negatively predicted paternal behavioral control. Unexpectedly, we found that fathers' behavioral control positively predicted mothers' behavioral control for parents of boys, but not for parents of girls, $\chi^2(1) = 12.72$, $p < 0.01$.

Parent-reported behavioral control. At the between-family level, we found no evidence for the hypothesized negative associations between parent-reported control and emotion regulation. However, in line with predicted sex differences, the mean random intercept of father-

reported behavioral control was significantly greater for girls than for boys, indicating that fathers reported controlling girls more than boys, $\chi^2(1) = 4.56$, $p = 0.03$.

Within-families, there were no significant predictive effects between parent-reported behavioral control and emotion regulation. There was, however, a significant bi-directional interplay between maternal and paternal control, indicating that parents followed each other's lead in terms of the control they exerted on their children.

Adolescent-perceived psychological control

At the between-family level, intercepts of adolescent-perceived maternal and paternal psychological control were both negatively correlated with the intercept of children's emotion regulation, as predicted. The strength of these associations did not differ significantly between mothers and fathers. We found no support for the hypothesized sex differences in the mean level of psychological control between boys and girls.

Within families, we found no evidence for the hypothesized effects of psychological control on adolescents' emotion regulation, but we did find significant child effects. Children's emotion regulation negatively predicted both parents' psychological control. These effects did not differ between mothers and fathers, $\chi^2(1) = 0.01$, $p = 0.91$.

Finally, across all models, the mean intercept of emotion regulation was significantly lower for girls than boys, indicating that, as predicted, girls reported lower emotion regulation than boys. This difference was significant, with χ^2s(1) between 23.06 and 27.62, ps < 0.001.

Discussion

The aim of the present study was to examine the role of parenting in emotion regulation development in mid to late adolescence. Substantial evidence was found for the hypothesized links between parenting and emotion regulation, but primarily when examining adolescent-

perceived parenting. Support played a greater role in adolescent-mother relationships, especially for girls, and behavioral control played a greater role in adolescent-father relationships. Across all models, parent effects were substantially outnumbered by child effects.

Parent effects

Parents are known to play an important role in emotion regulation socialization in infancy and early childhood (Eisenberg et al., 1998; Morris et al., 2007), but relatively little was known about the potential role of parents beyond early childhood. Our findings contribute to this literature, by demonstrating that in mid- to late-adolescence, children's perceptions of their parents' socialization practices are a significant predictor of their emotion regulation development. Specifically, daughters' perceived maternal support predicts increasing emotion regulation, and for all adolescents, decreasing perceived paternal control predicts increasing emotion regulation. These findings are largely in line with the self-determination theory perspective on parenting (Joussemet et al., 2008), which implies that adolescents flourish when parents support their autonomy needs. Our findings differ from parental socialization in early childhood: At a younger age, parental support plays a prominent role for both sexes (Morris et al., 2007; Thompson & Meyer, 2007). Our results suggest that, in mid- to late-adolescence, support still plays a role between mothers and daughters, but less so between mothers and sons. Moreover, parental behavioral control is thought to benefit young children's emotion regulation (Morris et al., 2007). We found no evidence for positive effects of behavioral control in mid- to late-adolescence, but instead found that emotion regulation increased when adolescents perceived that fathers relinquished behavioral control. Our findings thus suggest that the same parenting behaviors have different connotations for adolescents than for younger children.

Child effects

Our results suggest that, in mid-to-late adolescence, emotion regulation predicts adolescents' perceptions of parenting. When emotion regulation increases, adolescents feel like they are supported more, and controlled less. The downside is that adolescents with difficulties in emotion regulation feel as though mothers reduce support, and fathers increase behavioral control. It is noteworthy that child effects substantially outnumbered parent effects. This may be explained, in part, by the age range we examined: Child effects increase in adolescence, as parent-child relationships become more egalitarian (Meeus, 2016). Indeed, research on younger children shows substantial evidence for parent effects on emotion regulation (e.g., see Eisenberg et al., 1998; Morris et al., 2007), whereas work with early adolescents also revealed mostly child effects (Otterpohl & Wild, 2015). An important caveat is that these child effects were based on adolescent-*perceived* parenting. Thus, one potential explanation is that shifts in emotion regulation abilities might color adolescents' perceptions of parents' behavior. Adolescents who experience difficulties coping with negative emotions might, for example, perceive their mothers as less supportive, because their need for support has increased – even if mothers' behavior did not change. Similarly, adolescents' tolerance for behavioral control might decrease when they are experiencing emotion dysregulation, leading them to perceive parents as more controlling.

An alternative explanation is that adolescents are accurately reporting changes in parents' behaviors that parents themselves do not notice (see Gonzales et al., 1996). Prior research has found that parents disengage in response to children's problem behaviors, by reducing support and control (Huh, Tristan, Wade, & Stice, 2006; Kerr et al., 2012). Similarly, our findings suggest that adolescents feel like mothers respond to difficulties in emotion regulation by decreasing support – but they also report increases in fathers' behavioral control and both

parents' psychological control. This suggests that adolescents feel like their parents respond to emotion dysregulation by attempting to step in and "fix" them (Barber & Harmon, 2002).

Correlations at the between-families level

For both adolescent-perceived and parent-reported parenting, we found that children of parents who provided greater support had higher levels of emotion regulation. Interestingly, for adolescent-perceived support, these links were stronger for fathers than for mothers, even though mothers' support played a larger role at the within-family level. One potential explanation is that adolescents' perceptions of fathers' support may have shaped emotion regulation development at an earlier age, as others have found (e.g., Sarkadi, Kristiansson, Oberklaid, & Bremberg, 2008). Another explanation might be found in different base-rates of maternal versus paternal support: On average, mothers provide high support, whereas fathers' support is more variable (Laible & Carlo, 2004). Because greater variability implies a potentially larger correlation, differences in fathers' support might matter more. Finally, another explanation might be that third variables predict both paternal support and children's emotion regulation. For example, sociologists have argued that fathers' involvement in parenting is increasingly becoming a privilege of the highly educated (Perelli-Harris et al., 2010). Highly educated fathers are often able to afford houses in safer neighborhoods and to buy nutritious food, which predicts desirable childhood outcomes (Cabrera & Peters, 2000). Fathers' higher education might thus independently predict fathers' parenting behaviors and children's outcomes, causing them to be correlated. Surprisingly, for parent-reported parenting, paternal support was not significantly correlated with emotion regulation, whereas maternal support was. As support is thought to be an especially important socialization mechanism for mothers (Lamb & Lewis, 2013), mothers' perceptions of the support they provide their children might be more accurate.

We found no between-family level associations between behavioral control and emotion regulation. The fact that we did find negative predictive within-family effects from adolescent-perceived paternal control to emotion regulation raises the question whether these negative links first come to the fore in mid-to-late adolescence. If parental behavioral control had also negatively predicted emotion regulation at an earlier age, we should have observed a between-family level correlation. Perhaps adolescents' increasing autonomy needs lead them to question the legitimacy of parental behavioral control, so that greater parental control comes to be perceived as intrusive, and undermines autonomous emotion regulation (Smetana, 1995).

We further found that children who perceived their parents to be more psychologically controlling had lower levels of emotion regulation. There is substantial evidence that psychological control is linked to younger children's emotion regulation difficulties (Barber & Harmon, 2002; Morris et al., 2002). Thus, the between-family level correlation we found might reflect accumulated effects of psychological control on children's emotion regulation throughout childhood.

Differences between mothers and fathers

Attachment theorists have argued that mother-child relationships are primarily rooted in warmth and comfort, whereas fathers challenge children, thereby providing unique contributions to socio-emotional skills, including emotional adjustment (Majdandžić et al., 2014; Paquette, 2004). In line with this point of view, we found that perceived support played a role in mother-adolescent relationships, and perceived behavioral control in father-adolescent relationships. The finding that emotion regulation increased when adolescents felt like fathers relinquished behavioral control can be construed as an age-appropriate manifestation of the "activation relationship" (Paquette, 2004): Fathers challenge adolescents by decreasing explicit demands to

live up to family and societal norms, and providing less structure for adolescents to do so – thereby requiring them to live up to these norms autonomously. Conversely, adolescents' autonomy needs might be frustrated if fathers do *not* gradually reduce control, as adolescents increasingly come to view paternal control as invasive (Smetana, 1995). This could place a burden adolescents' emotion regulation, and curb its development.

Differences between sons and daughters

In line with prior research, we found that girls reported greater difficulties in emotion regulation than boys. Also in line with prior research (e.g., Leaper et al., 1998; Pomerantz & Ruble, 1998), we found evidence that, according to both adolescent- and parent-reports, girls received greater support from mothers, and greater behavioral control from parents, than boys. Finally, perceived maternal support positively predicted girls', but not boys', emotion regulation. Our results did not support social learning theory's proposition that links between parents and the same-sex child are stronger (Bussey & Bandura, 1999). Instead, our results were more in line with the notion that mother-daughter relationships are particularly close, and that support plays a more prominent role in mother-daughter relationships (Branje et al., 2013; Denham et al., 1997).

Reporter discrepancies

Although children's and parents' perceptions of parenting diverge in adolescence, (Bengtson & Kuypers, 1971), discrepancies between their reports are rarely examined (De Los Reyes & Kazdin, 2005). Many prior studies have relied only on adolescents' reports of problem behaviors and parenting (Huh et al., 2006; Kakihara et al., 2009; Kerr et al., 2012; Stattin & Kerr, 2000; Van der Giessen, Branje, & Meeus, 2014; Wijsbroek, Hale, Raaijmakers, & Meeus, 2011). Others have aggregated parents' and children's reports (Otterpohl & Wild, 2015). The present study set out to examine differences in the pattern of results for adolescent-perceived

versus parent-reported parenting. We predicted links between parenting and emotion regulation to be weaker for parent-reported than for adolescent-perceived parenting, because parent-reported parenting is known to be a poor predictor of children's emotional adjustment (Ackard et al., 2006; Cheung et al., 2016). In line with this prediction, we found substantial evidence for the hypothesized links between parenting and emotion regulation when examining adolescents' *perceptions* of parenting, but *parent-reported* parenting was mostly uncorrelated with emotion regulation. This validates the notion that adolescents' perceptions of parenting are a much stronger correlate of their emotion regulation development than parents' self-reports.

In terms of implications for research, this highlights the importance of assessing children's perceptions of parenting in relation to more covert aspects of their adjustment, as suggested by prior research (Cheung et al., 2016). With regards to interventions, our findings suggest that it might be at least as important to change adolescents' perceptions of their parents' childrearing behaviors, as it is to change parents' actual behaviors. Adolescents' growing capacity for perspective taking (Van Lissa, Hawk, de Wied, et al., 2014) might enable them to see matters from their parents' point of view. Moreover, recent experimental research showed that inciting adolescents to consider parents' point of view motivates them to work constructively towards mutual benefit in conflict discussions with parents (Van Lissa, Hawk, & Meeus, 2017). Future research should investigate whether inviting adolescents to reflect on the ways in which mothers support them, and fathers relinquish behavioral control, might benefit adolescents' emotion regulation development – and whether these effects are enhanced when such reframing is accompanied by actual behavioral change on the part of the parents.

Strengths and Limitations

The present study had several important strengths. First of all, the longitudinal design allowed us to answer the call for research on parents' role in emotion regulation development from mid to late-adolescence (Bariola et al., 2011). By including both parents' childrearing behaviors, we were able to compare unique influences of mothers and fathers. Obtaining multi-informant reports of parenting allowed us to examine differences in the pattern of results for adolescent-perceived versus parent-reported parenting. The most important contribution, however, is the use of innovative methods which account for stable differences between families, and provide more accurate estimates of over-time predictive effects within families. We found that parenting and emotion regulation are linked at both the between- and within-families level. Future research should be conscious of this distinction, and the potential pitfalls of failing to account for between-family differences when examining within-family processes.

The present study also had several caveats. Relying on adolescent reports for both the parenting variables and emotion regulation might introduce common method bias. However, a common assumption is that this bias affects all measurement occasions equally (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Under this assumption, common method bias is reflected in the correlations between the random intercept variables, and the within-family predictive effects are controlled for its potential influence. Moreover, common method bias cannot explain a differentiated pattern of findings, in line with hypotheses derived from prior research which used different methods and sources of information. Another limitation is the fact that we investigated the interplay between specific parenting *dimensions* and emotion regulation, whereas some have argued that these dimensions should be considered in concert, in terms of parenting *styles* (Maccoby & Martin, 1983). Both of these approaches have yielded valuable

complementary insights to date (see Kerr et al., 2012). In the present study, it was unfeasible to combine parenting dimensions into parenting styles for two reasons: Firstly, since the literature suggested an asymmetry in the role of support and control in mothers' and fathers' socialization of emotion regulation, it was necessary to investigate these dimensions in isolation. Secondly, the random-intercept cross-lagged panel model is not amenable to categorical predictors, so it would be unfeasible to tease apart between- and within-family variance using parenting styles. A final potential limitation is that our measures of parenting reflected parenting behaviors in general; not emotion socialization specifically (cf. Klimes-Dougan et al., 2007). Future research might, for example, use dyadic interactions to investigate whether parents' supportive and controlling responses to adolescents' situational emotion regulation have similar effects to the ones we found using self-report measures.

Conclusions

The present paper demonstrated that parents continue to play a role in emotion regulation development in adolescence – at least when it comes to adolescents' perceptions of parenting. We also included fathers who, despite being theorized to play a unique role in emotion socialization, have rarely been studied. We found evidence indicating that perceived support primarily played a role between mothers and adolescents, whereas perceived behavioral control played a role between fathers and adolescents. Thirdly, in line with the transactional perspective, we examined bi-directional influences between parenting and emotion regulation. Child effects substantially outnumbered parent effects, which might reflect the increasing equality of adolescent-parent relationships (Branje et al., 2013). Fourth, we examined both adolescent-perceived and parent-reported parenting. As the aforementioned child effects were found for adolescent-perceived parenting behavior, it is also possible that shifts in emotion regulation

abilities color adolescents' perceptions of parents' behavior. Overall, our results suggest that, in adolescence, perceptions of parenting are a stronger correlate of emotion regulation development than parents' self-reports. This implies that, in clinical settings, it might be at least as important to change adolescents' perceptions of parents' behavior, as it is to change parents' actual behaviors. Finally, we used cutting edge statistical techniques to control for stable differences between families, and obtain more accurate estimates of within-family (potentially causal) processes. In line with the self-determination perspective on adolescent development, our main finding is that adolescents' emotion regulation benefits most when they feel like parents are meeting their increasing need for autonomy by providing support, and relinquishing control.

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Table 1. Variable means and standard deviations, by wave and adolescent sex

		Support				Behavioral control				Psychological control				Emotion regulation	
		Mother		Father		Mother		Father		Mother		Father			
Wave	Sex	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Adolescent reports															
1	Boys	3.65	0.56	3.48	0.58	3.29	1.02	2.97	1.04	1.72	0.68	1.85	0.71	4.15	0.56
	Girls	3.78	0.64	3.39	0.67	3.51	1.03	3.08	1.04	1.85	0.76	1.96	0.83	3.83	0.78
	Total	3.70	0.60	3.44	0.62	3.39	1.03	3.02	1.04	1.77	0.72	1.90	0.77	4.01	0.68
2	Boys	3.52	0.62	3.40	0.62	3.09	1.02	2.75	1.00	1.79	0.70	1.89	0.72	4.16	0.57
	Girls	3.78	0.61	3.35	0.67	3.52	1.13	3.07	1.08	1.96	0.78	1.96	0.78	3.80	0.79
	Total	3.63	0.63	3.38	0.64	3.27	1.09	2.89	1.05	1.86	0.74	1.92	0.74	4.00	0.70
3	Boys	3.53	0.59	3.35	0.66	2.67	1.05	2.53	0.97	1.73	0.69	1.82	0.70	4.13	0.57
	Girls	3.80	0.65	3.36	0.75	3.21	1.17	2.77	1.13	1.89	0.79	1.92	0.80	3.82	0.80
	Total	3.65	0.63	3.36	0.70	2.91	1.13	2.64	1.05	1.80	0.74	1.87	0.75	4.00	0.69
4	Boys	3.47	0.63	3.34	0.63	2.44	1.06	2.22	0.91	1.74	0.75	1.81	0.71	4.04	0.66
	Girls	3.77	0.61	3.32	0.78	2.78	1.23	2.36	1.11	1.89	0.77	1.90	0.81	3.83	0.81
	Total	3.60	0.64	3.33	0.70	2.58	1.15	2.28	1.00	1.80	0.76	1.85	0.75	3.95	0.73
Parent reports															
1	Boys	3.41	0.44	3.25	0.47	4.13	0.97	3.92	0.95						
	Girls	3.48	0.45	3.23	0.47	4.21	0.92	4.00	0.92						
	Total	3.44	0.44	3.24	0.47	4.16	0.95	3.96	0.94						
2	Boys	3.37	0.44	3.17	0.50	3.80	1.11	3.62	1.03						
	Girls	3.52	0.46	3.23	0.44	3.88	1.00	3.75	1.00						
	Total	3.44	0.45	3.20	0.48	3.83	1.06	3.67	1.02						
3	Boys	3.34	0.46	3.19	0.48	3.30	1.13	3.20	1.07						
	Girls	3.49	0.48	3.19	0.47	3.33	1.11	3.24	1.04						
	Total	3.40	0.47	3.19	0.48	3.31	1.12	3.22	1.06						
4	Boys	3.38	0.48	3.17	0.55	2.80	1.08	2.65	1.01						
	Girls	3.51	0.52	3.20	0.49	2.91	1.16	2.93	1.03						
	Total	3.44	0.50	3.19	0.52	2.84	1.11	2.77	1.03						

Table 2. Adolescent-report model fit indices

Model	χ^2	df	scf	AIC	aBIC	RMSEA	CFI	TLI	$\Delta\chi^2$ p value
Support									
1. Unconstrained CLPM	115.92	27	1.45	7430.35	7493.35	0.08	0.95	0.89	-
2. Constrained CLPM	136.89	51	1.40	7406.22	7445.22	0.06	0.95	0.94	0.83
3. Single group RI-CLPM	35.95	45	1.32	7273.63	7318.63	0.00	1.00	1.01	0.00
4. Sex mod., all free RI-CLPM	160.20	114	1.27	7191.91	7257.90	0.04	0.98	0.97	0.00
5. Sex mod., constrained RI-CLPM	174.06	130	1.30	7183.99	7233.99	0.04	0.98	0.98	0.52
Behavioral Control									
1. Unconstrained CLPM	90.20	27	1.27	11121.53	11184.52	0.07	0.97	0.92	-
2. Constrained CLPM	114.67	51	1.23	11100.11	11139.11	0.05	0.97	0.96	0.56
3. Single group RI-CLPM	42.43	45	1.22	11022.33	11067.32	0.00	1.00	1.00	0.00
4. Sex mod., all free RI-CLPM	167.45	114	1.11	10965.61	11031.60	0.04	0.97	0.97	0.00
5. Sex mod., constrained RI-CLPM	184.85	129	1.13	10959.44	11010.43	0.04	0.97	0.97	0.27
Psychological control									
1. Unconstrained CLPM	119.97	27	1.36	8414.78	8477.77	0.09	0.95	0.88	-
2. Constrained CLPM	147.40	51	1.38	8408.08	8447.07	0.06	0.95	0.93	0.23
3. Single group RI-CLPM	49.69	45	1.37	8283.90	8328.90	0.02	1.00	1.00	0.00
4. Sex mod., all free RI-CLPM	151.80	114	1.29	8259.99	8325.98	0.04	0.98	0.98	0.01
5. Sex mod., constrained RI-CLPM	178.10	134	1.34	8262.49	8308.48	0.04	0.98	0.98	0.15

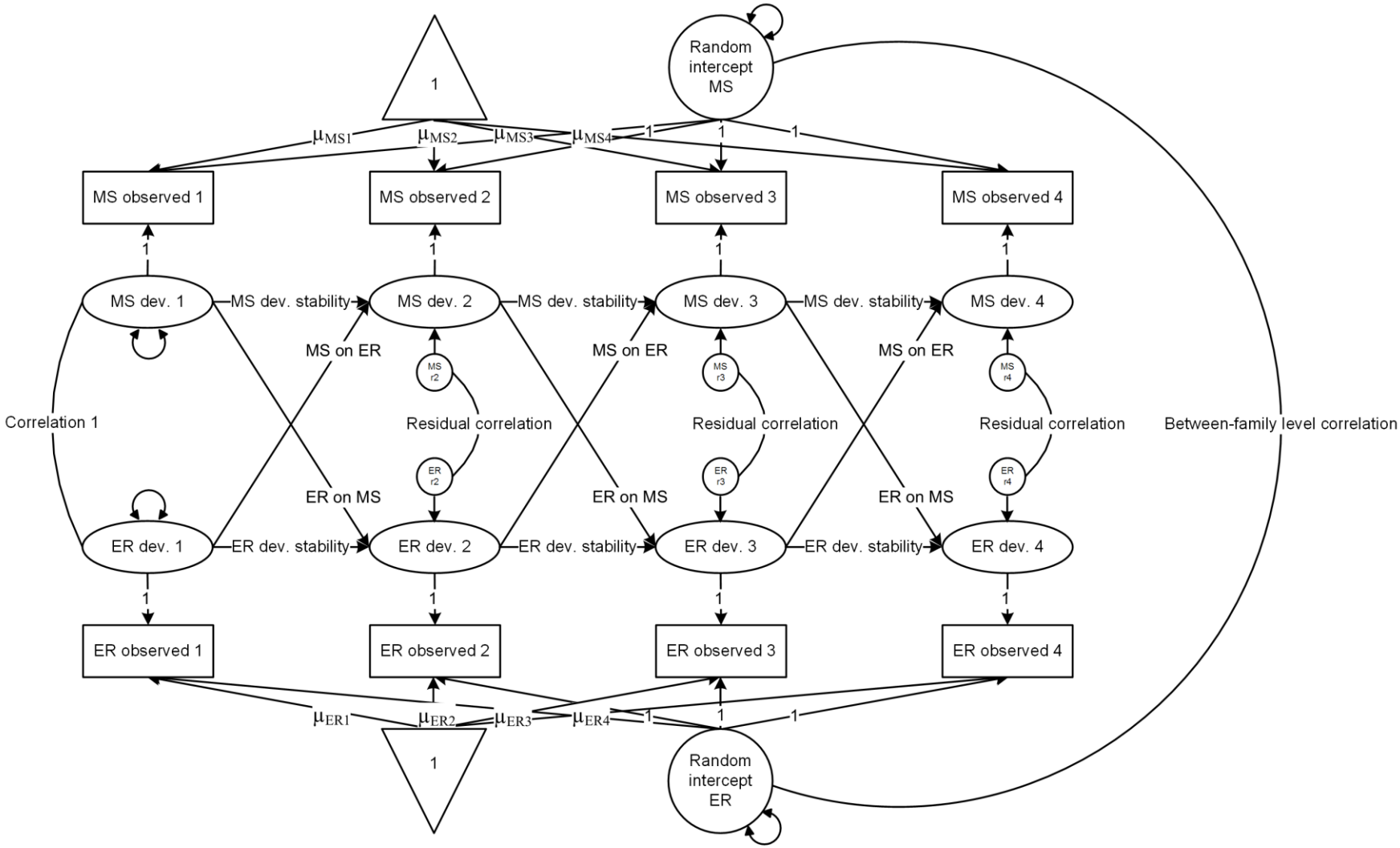
Note. Sex mod.: moderated by adolescent sex. Constrained: parameters not significantly different between boys and girls have been constrained.

Table 3. Parent-report model fit indices

Model	χ^2	df	scf	AIC	aBIC	RMSEA	CFI	TLI	$\Delta\chi^2$ p value
Support									
1. Unconstrained CLPM	176.16	27	1.17	5435.13	5498.38	0.11	0.94	0.86	-
2. Constrained CLPM	207.92	51	1.15	5420.74	5459.89	0.08	0.94	0.92	0.21
3. Single group RI-CLPM	52.49	45	1.05	5248.36	5293.54	0.02	1.00	1.00	0.00
4. Sex mod., all free RI-CLPM	198.12	114	1.06	5222.86	5289.12	0.06	0.97	0.96	0.00
5. Sex mod., constrained RI-CLPM	216.35	133	1.07	5206.89	5254.08	0.05	0.97	0.97	0.46
Behavioral Control									
1. Unconstrained CLPM	136.72	27	1.04	11040.16	11103.42	0.09	0.95	0.88	-
2. Constrained CLPM	156.69	51	1.03	11011.21	11050.37	0.07	0.95	0.94	0.76
3. Single group RI-CLPM	61.31	45	1.00	10923.39	10968.57	0.03	0.99	0.99	0.00
4. Sex mod., all free RI-CLPM	180.74	114	1.00	10913.72	10979.99	0.05	0.97	0.96	0.00
5. Sex mod., constrained RI-CLPM	197.64	133	1.03	10898.46	10945.65	0.05	0.97	0.97	0.47

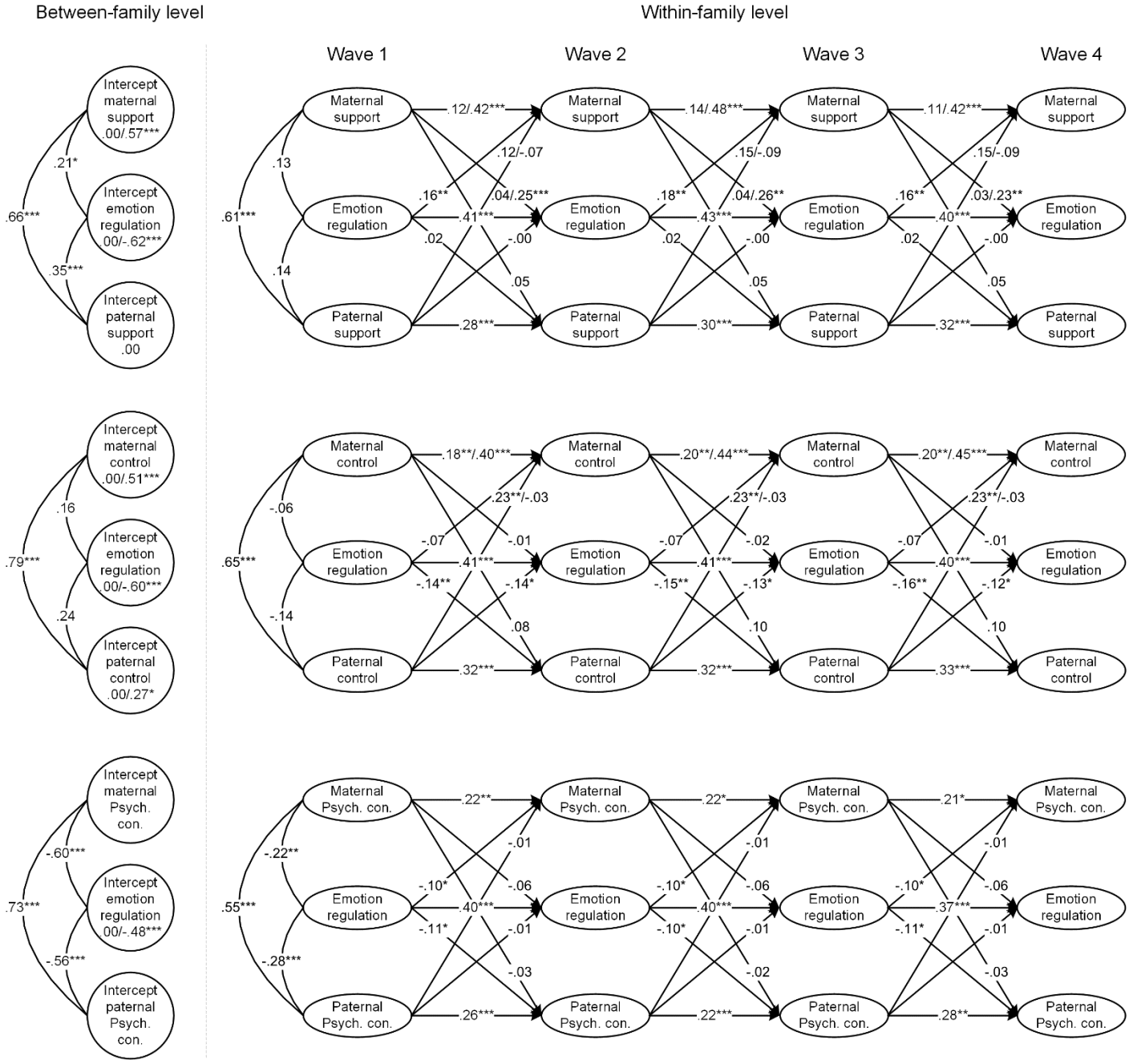
Note. Sex mod.: moderated by adolescent sex. Constrained: parameters not significantly different between boys and girls have been constrained.

Figure 1. Accurate representation of a two-variable random-intercept cross-lagged panel model.



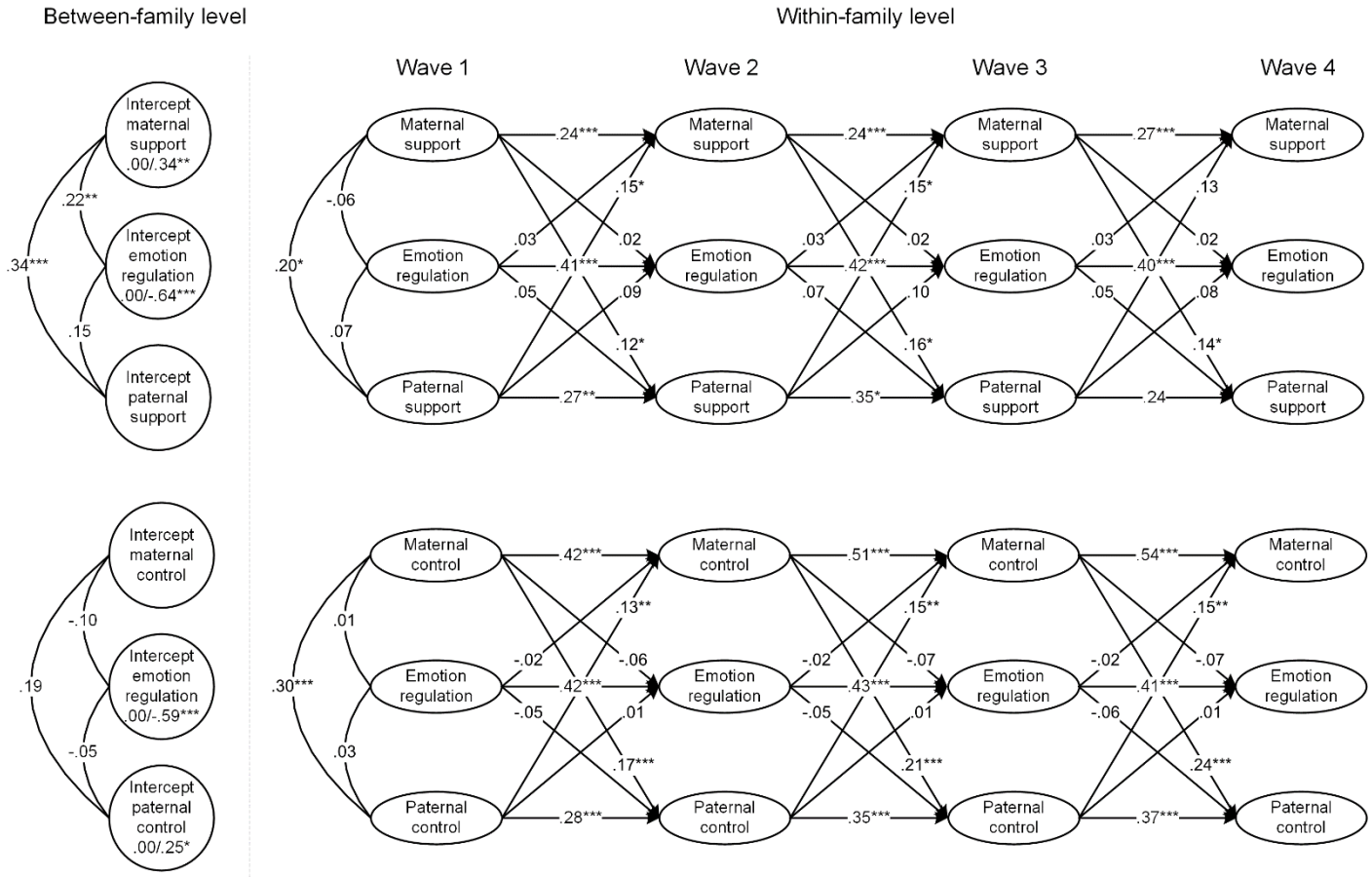
Note. Four-wave RI-CLPM of maternal support (MS) and emotion regulation (ER). The variance of observed indicators is partialized into a between-family level random intercept, and within-family level deviations (dev.). Numbered parameters are estimated freely; unnumbered parameters are constrained over time. For the present study, this model has been extended by adding a third variable. Simplified illustrations of the final models are presented in Figures 2 and 3.

Figure 2. Simplified representation of models for adolescent-perceived parenting.



Note. For all parameters, see Supplementary Table S2. Parameters significantly different between boys and girls are presented as: Boys/Girls (e.g., .04/.27***). * $p \leq .05$, ** $p < .01$, *** $p < .001$

Figure 3. Simplified representation of models for parent-reported parenting.



Note. For all parameters, see Supplementary Table S2. Parameters significantly different between boys and girls are presented as: Boys/Girls (e.g., .04/.27***). * $p \leq .05$, ** $p < .01$, *** $p < .001$