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Longitudinal Relations Between Interparental Conflict and Adolescent Self-Regulation: The Moderating Role of Attachment to Parents

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Longitudinal Relations Between Interparental Conflict and

Adolescent Self-Regulation: The Moderating Role of

Attachment to Parents

Lisa Tensmeyer Hansen

A dissertation submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

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ABSTRACT

Longitudinal Relations Between Interparental Conflict and Adolescent Self-Regulation: The Moderating Role of Attachment to Parents

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Doctor of Philosophy

This study used growth curve analysis to investigate associations between interparental conflict, attachment to parents, and adolescent self-regulation outcomes. Using data from 681 families in the *Flourishing Families* survey obtained in two western U.S. cities, associations between interparental conflict, mother and father attachment, and initial and growth levels of adolescent self-regulation were analyzed across five time points. Adolescent self-regulation showed steady growth across a five-year period during adolescence, suggesting that self-regulation may continue to develop generally throughout adolescence, a finding not revealed in prior research. Adolescent self-regulation increased significantly more in the first city over the five years of the study than in the second. Interparental conflict predicted lower adolescent self-regulation scores initially, confirming prior research, but interparental conflict did not depress the rate at which adolescent self-regulation developed. As interparental conflict increased, attachment to parents decreased, with attachment to father experiencing a greater negative effect than attachment to mother. No moderation effects were found for the interaction of interparental conflict and attachment to parents regarding adolescent self-regulation.

Keywords: interparental conflict, attachment to parents, adolescent self-regulation

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Longitudinal Relations Between Interparental Conflict and Adolescent Self-Regulation: The Moderating Role of Attachment to Parents

Self-regulation has been described as an individual's ability to manage distressing emotional arousal, to initiate behavioral and emotional changes during emotionally charged situations, and to exercise effortful control of behavior (Denham, 1998; Dennis, 2006; Eiden, Edward, & Leonard, 2007; Grolnick & Farkas, 2002; Saarni, 1999). It has been described as the key to human adaptation, the source of our perception of personal agency (Zimmerman, 2000). Research suggests that self-regulation developed in childhood predicts a wide variety of adolescent social, emotional, behavioral, academic and physiological outcomes (Caspi, Henry, McGee, Moffitt, & Silva, 1995; Denham, Blair, DeMulder, Levitas, Sawyer, & Auerbach-Major, 2003; Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002; Moffitt & Caspi, 2001). For example, self-regulation has been associated with school achievement (Posner & Rothbart, 2009), development of conscience (Kochanska, Murray, Jacques, Koenig, & Vendegeest, 1996), and resilience to peer influence (Grolnick & Farkas, 2002; Steinberg & Silverberg, 1986). Vohs and Baumeister (2011) described self-regulation as "one of the most centrally important concepts in all of psychology." Given its association with such a wide array of positive adolescent outcomes, it makes sense to discover how self-regulation is optimized during adolescence.

The importance of self-regulation in relation to successful adolescent outcomes has given rise to a number of studies seeking to understand how self-regulation is developed in childhood. Childhood studies of self-regulation far outnumber studies of self-regulation in adolescence (i.e., Eisenberg et al., 2001; Fonagy & Target, 2002, Hoerger, Quirk, & Weed, 2011; O'Connor, O'Carroll, Ryan, & Smyth, 2012). Self-regulation research has demonstrated that children's ability to self-regulate develops until age eight or nine, but a thorough review of adolescent

studies suggests that no studies have attempted to discover additional self-regulation development in adolescence (Raffaelli, Crockett, & Shen, 2005; Sawyer, Searle, Miller-Lewis, Sawyer, & Lynch, 2015). Research seems to assume that by early adolescence, self-regulation is a persistent and stable construct of personality which, although it may be influenced somewhat by external processes, has reached a developmental plateau (Carlo, Crockett, Wolff, & Beal, 2012; Kobak, Cole, Ferenz-Gillies, Fleming, & Gamble, 1993; Moilanen, Shaw, & Fitzpatrick, 2010; Trentacosta & Shaw, 2009). The reasons for the assumed plateau are unclear but may be related to the idea that the major brain structures responsible for self-regulation are formed primarily during childhood (Siegel, 2012).

However, fMRI research by Yurgelun-Todd (1998) indicates that brain circuits supporting self-regulation are significantly reorganized in adolescence. Spear (2000) and Crone (2009) both noted a rapidly growing body of studies which show that the brain undergoes a significant reorganization during adolescence second only to the period of infancy. Although a comprehensive search of research on adolescent development discovered no studies exploring whether adolescent self-regulation demonstrates developmental trends during adolescence, it is likely that a continually developing neural capacity would result in further development of self-regulation ability, resulting in developmental trends or patterns which could be measured. Consequently, this study aimed to assess adolescent self-regulation scores longitudinally over five years to see whether self-regulation ability continues to develop during adolescence.

Variables which increase or decrease adolescents' ability to self-regulate are important in understanding the antecedents of optimum adolescent self-regulation. Because interparental conflict has been specifically associated with lower self-regulation in children (Eisenberg, Zhou, Spinrad, Valiente, Fabes, & Liew, 2005), and because interparental conflict has been associated

with adolescent emotional reactivity and internalizing behaviors (Buehler & Welsh, 2009), it is hypothesized that interparental conflict might have a similar negative impact on adolescent self-regulation. Although adolescents may not experience the same degree of disruption in response to interparental conflict as younger children do, if adolescent self-regulation is still developing, it is possible that the greater emotional reactivity and internalizing behaviors associated with interparental conflict could have a negative impact on the potential development of self-regulation during adolescence. Consequently, this study sought to explore both the effect of interparental conflict on adolescent self-regulation and its effect on the rate of development of self-regulation during adolescence. This study also sought to discover potential buffers in the presumably negative relationship between interparental conflict and adolescent self-regulation. Because previous research has suggested that certain parenting variables which increase child security and parental availability buffer the effect of interparental conflict on younger children's self-regulation (Katz & Gottman, 1995), this study sought to explore whether adolescent attachment to parents acts as a buffer or moderator for older children in the relationship between interparental conflict and adolescent self-regulation.

Self-Regulation as a Measure of Adolescent Well-Being

Self-regulation refers to the capacity of the self to manage thoughts and emotions in order to alter one's behavior (Baumeister & Vohs, 2007). It implies the ability to flexibly activate, monitor, inhibit, persevere and/or adapt one's behavior, attention, emotions and cognitive strategies in response to direction from internal cues, environmental stimuli and feedback from others (Hrbackova & Vavrova, 2015). Adolescents with better self-regulation report better anger management, exhibit more empathy, and are less prone to focus on personal distress, all of which are linked to positive outcomes (Tangney, Baumeister, & Boone, 2004). Adolescents with better

self-regulation demonstrate fewer impulse control problems, and decreased levels of depression, anxiety, hostile anger, phobic anxiety, paranoid ideation, psychoticism (Tangney et al., 2004), and interpersonal violence (Finkel, DeWall, Slotter, Oaten, & Foshee, 2009). In addition, self-regulation seems to predict healthy future relationships, effective coping, better mental health and less susceptibility to substance abuse and criminality (Gaillot, Plant, Butz & Baumeister, 2007; Mischel, Shoda, & Peake, 1988). These studies and other research findings support using self-regulation as a measure of adolescent well-being (Hoyle, 2010; Mowder, Rubinson & Yasik, 2012; Tesser & Schwarz, 2007). This study explores how interparental conflict and parental attachment impact such self-regulation over five years during adolescence.

Theoretical Foundations

The effect of interparental conflict on self-regulation. According to Bronfenbrenner's bioecological theory, children's emotional and behavioral outcomes are not only shaped by the characteristics of the child, but also by social structures closest to the child (Bronfenbrenner, 1986; Tudge, Mokrova, Hatfield, & Karnik, 2009). It makes sense that family interactions are primary social interactions which are likely to influence self-regulation. Morris, Silk, Steinberg, Myers, and Robinson (2007) identify three pathways by which family influence is likely to influence self-regulation, and one of these pathways includes the emotional quality of the marital relationship. Conflict between parents is likely to affect the emotional quality of the marital relationship, thereby impacting children's self-regulation. Interparental conflict among married parents, step-parents, or separated parents has been shown to play an important role for pre-adolescent children in learning adaptive and maladaptive ways to manage distressing emotions (Cummings & Davies, 1994). Many studies have shown that children exposed to hostile interparental conflict are at increased risk for social, emotional and behavioral problems

(Cummings & Davies, 2002; Cummings & Keller, 2006; Goeke-Morey, Cummings, Harold, & Shelton, 2003; Grych & Fincham, 1990; Sturge-Apple, Davies, & Cummings, 2006).

Interparental conflict has been specifically associated with lower self-regulation in pre-adolescent children (Eisenberg et al., 2005), though the relationship between interparental conflict and self-regulation does not appear to have been studied in adolescence (Schulz, Waldinger, Hauser & Allen, 2005). However, several studies have found that increases in marital conflict predicted corresponding decreases in adjustment problems over time for adolescents (Buehler & Welsh, 2009; Cui, Conger & Lorenz, 2005). It seems likely that if self-regulation continues to develop during adolescence, interparental conflict might impact the development of self-regulation in adolescence as well.

Several theories underlie potential mechanisms by which interparental conflict might impact adolescent self-regulation. A growing body of research underscores the idea that social relationships generally have meaningful effects on an individual's self-regulation ability (Calkins & Leerkes, 2011; Vohs & Finkel, 2006). Relationships offer support, which can be defined as processes by which one person helps another to engage in effective self-regulation, although the mechanisms by which social relationships influence self-regulation have not been clarified. Two possible mechanisms by which social relationships might influence self-regulation include the psychological resource theory and the emotional security theory.

The psychological resource theory (Baumeister, Vohs, & Tice, 2007), suggests that when social interactions require greater control, or "high maintenance" (Finkel et al., 2006), participants afterwards generally show depleted levels of self-regulation, compared to self-regulation levels following "low maintenance" interactions. Social relationships requiring higher maintenance may negatively influence self-regulation. Because episodes of interparental conflict

are likely to trigger emotionally charged situations, adolescents' ability to manage emotions and behaviors during conflict episodes may require greater control, or "high maintenance" (Finkel, et al., 2006), depleting adolescents' self-regulation. Higher levels of interparental conflict might then result in more chronically depleted (lower levels) of adolescent self-regulation. The "depletion effect" proposed by Finkel, et al. (2006) suggests that high maintenance efforts on the part of adolescents might be the mechanism by which interparental conflict affects adolescent self-regulation.

A second mechanism which may explain how interparental conflict impacts adolescent self-regulation is the emotional security hypothesis (Davies & Cummings, 1994; Siegel, 2012). According to this hypothesis, ongoing, intensive interparental conflict leads to emotional insecurity in children, who may then exhibit higher emotional distress and reactivity. Emotional insecurity then constrains the ability to regulate negative emotions such as sadness, anger, and fear (Schwarz, Stuz & Ledermann, 2012). Kaczynski and colleagues (Kaczynski, Lindahl, Malik & Laurenceau, 2006) theorized that children who experience interparental conflict may be receiving low emotional support, which could then impact their self-regulation.

Attachment to parents as a moderator in the relationship between interparental conflict and adolescent self-regulation. According to the emotional security hypothesis, family processes may strengthen or weaken associations between interparental conflict and child insecurity. Access to emotional support, comfort, and protection within warm family relationships might allow a child to successfully cope with insecurities about family difficulties (Davies et al., 2002). Such support processes within the family may buffer the anticipated negative relationship between interparental conflict and child insecurity. Davies and colleagues (2002) further theorized that the magnitude of associations between interparental conflict, child

emotional insecurity and child adjustment varied as a function of attachment insecurity and parental warmth. They believed that interparental conflict takes on a different, more benign meaning in the context of warm, cohesive, and expressive family relationships. These researchers' derivative hypothesis was that the relationship between interparental conflict and child emotional insecurity is weaker for children who experience warm, cohesive, and expressive family relationships (Davies et al., 2002).

Warm, cohesive, and expressive relationships with parents have been shown to successfully differentiate between adolescents who experience secure attachment to parents and those whose attachment is insecure (Karavasilis, Doyle & Markiewicz, 2003). Because attachment behaviors may potentiate the relationship between interparental conflict and child adjustment (Davies et al., 2002), attachment to parents is theorized in this study as a potential buffer (moderator) in the relationship between interparental conflict and adolescent self-regulation.

Adolescents with more secure attachment to parents may experience less depletion of self-regulation ability (psychological resource theory – Finkel et al., 2006), or greater emotional security in the context of family relationships (emotional security theory – Siegel, 2012). Schore (2003a, p. 174) theorized that although stressful events can be emotionally overwhelming and disorganizing, the adolescent with secure attachment can access emotionally available parents and experience “interactive regulation.” However, if, during interparental conflict, the adolescent finds her parents emotionally unavailable, the quality of her own attachment security may determine whether she is able to self-regulate in their absence.

Attachment security and self-regulation in pre-adolescent children. Current theory regarding attachment security and its role in self-regulation has its roots in the work of John

Bowlby (1977), who proposed that human attachment bonds evolved because they increased chances of survival. Bowlby and Ainsworth (1967) suggested that attachment experiences such as consistent caregiver responsiveness, warmth, and affectionate support build security directly into children's nervous systems, allowing children to develop the ability to regulate emotion and behavior. Trevarthen (1990) saw emotional communication between caregiver and child as the regulator of brain growth, directly affecting later regulation of the adult brain. The idea that social processes lead to brain organization and self-regulation inspired studies attempting to identify which brain circuitries might be developed in a particular environment and how these could affect the child's ability to exercise emotional, cognitive, and behavioral self-control (Feldman, Greenbaum, & Yirmiya, 1999; Price, Carmichael, & Drevets, 1996; Tronick & Weinberg, 1997; Zald & Kim, 1996). In the last decade, attachment has been studied as both a behavioral and a physiological set of processes that maintain and regulate sustained social relationships (Hofer, 2006; Mikulincer & Shaver, 2007; Siegel, 2012; Simpson & Rholes, 2012; Van der Kolk, 2014).

According to Bowlby (1977), attachment bonds become especially activated when individuals feel threatened, distressed, or challenged. Depending on whether caregivers have been sensitive and consistently responsive, individuals may react to stress in ways that connect them to others (secure attachment), or ways that keep them separated from others (anxious or avoidant attachment). Stress activates such attachment patterns, which show evidence of having been wired into the brain (Schoore, 2003a, 2003b). For example, maltreatment from caregivers early in life has been linked to epigenetic regulatory changes in areas of the brain that intensify the stress response (McGowan, Sasaki, D'Alessio, Dymov, Labonté et al., 2009), suggesting that regulation can be severely hampered following early trauma or neglect (Siegel, 2012).

In particular, the child's attachment bonds with her parents appear to have a profound effect on the child's later ability to function within the social world (Bowlby, 1988b, Sroufe, Egeland, Carlson, & Collins, 2005; Sroufe & Siegel, 2011; Siegel, 2012). In the first year of life, the child uses the mature functions of a caregiver to organize her own processes (Hofer, 2006). When the child is hungry or understimulated, for example, her resulting distress cannot yet be managed by her internal processes, but is addressed by a caregiver who feeds the child, interacts with her, or otherwise soothes and comforts her. The consistency and quality of the nurturance appears to predict the quality of her attachment bonds to that adult (Ainsworth, Blehar, Waters, & Wall, 1978) and to others in the future (Main, Kaplan, & Cassidy, 1985; Sroufe, 1996).

The quality of the nurturance the child receives also helps her react to and regulate her own distressing emotions. If the nurturance she receives is generally responsive to her emotional and physical needs, she experiences the regulation of her emotions that occurs when distress is relieved (Hofer, 1994; Polan & Hofer, 2008). She learns to associate the nurturance she receives with reduction of distressing emotions. Eventually, she begins to discover the ability to regulate her own emotions as she responds to distress by solving problems (using both internal and external solutions), which may relieve her distress (Ainsworth et al., 1978). For example, a child who knocks a toy out of reach may experience distress until that toy is restored to her. The person who returns the toy and relieves the child's distress is engaged in a kind of nurturing behavior, which, over time, may create attachment bonds. The child may then depend on that person to return her toys when they are (perhaps repeatedly) knocked out of reach. By signaling the person to help her retrieve the toy, whether by tears, gestures, or otherwise expressing distress, the child has learned to regulate her emotions through experiencing the relieving actions of another person. Then when the child later develops motor skills that allow her to (at last)

pursue the toy herself, she experiences relief from distress as she herself acts to retrieve the toy, thus regulating her own emotions. When the child acts to relieve her own distress or to engage others to relieve her distress, she is engaging in the process of self-regulation. Eventually the child learns that some toys are not going to be retrieved. Her ability to self-regulate will be reflected in how able she is to integrate experiences of denial or disruption and manage the resulting distressing emotions within a functioning personality. This is more likely to be accomplished when the child has had experiences with relief from distress and experiences with a caregiver who models strategies of emotional self-regulation.

If the nurturance the child receives is of poor quality, is inconsistent or inadequately tuned in to the child's emotional or physical needs, the child's emotional distress may continue unrelieved and her experience of helplessness increase (Slade, Grienenberger, Bernbach, Levy & Locker, 2005). Without a caregiver who provides and models relief, it is less likely that the child will associate her interaction with the caregiver with relief from distress. Her later ability to self-regulate may be limited by the lack of experience of relief from distress which would occur with more a responsive attachment relationship (Demo & Cox, 2000; Malatesta-Magai, 1991). Without that experience of secure attachment and distress relief, she may react to her own distress by avoiding emotional bonding with her caregiver, or by expressing greater anxiety around closeness with her caregiver (Cassidy, 1994). These reactions do not allow her to regulate emotions in a way that relieves her distress. A child who does not have successful experiences regulating emotions through attachment to a caregiver will have a more difficult time regulating her own emotions (Reite & Capitanio 1985; Schore, 2003a).

The quality of parental attachment, then, affects a child's ability to regulate emotions (Slade, et al., 2005). The quality of parental attachment also seems to affect children's ability to

regulate distressing thoughts (through the development of the right prefrontal cortex, Barbas, 1995; Joseph, 1996; Schore, 2003a) and to regulate behavior (Fox & Hane, 2008, Schore, 2003a). The capacity to reflect on and regulate emotional states, cognitions and behaviors appears to emerge from within the child's attachment relationships (Schore, 2001, 2003a; Siegel, 2012).

Attachment and self-regulation in adolescents. Few research studies have examined the links between attachment and self-regulation beyond early childhood (Calkins & Leerkes, 2011), although Allen and Land (1999) observe that the attachment system continues to influence self-regulation into the adolescent years, and several researchers observe the influence of attachment on self-regulation into adulthood (Brown, 1993; Finkel & Fitzsimons, 2011; Siegel, 2012). This study aimed to explore the effect of parental attachment on adolescent self-regulation in the presence of interparental conflict. Attachment was conceptualized as being likely to provide the adolescent both psychological resources and emotional security, perhaps buffering the negative impact of interparental conflict on adolescent self-regulation, thus acting as a moderator in the relationship between interparental conflict and adolescent self-regulation.

The Current Study

The present study examined the associations between important familial factors which may be antecedents in the development of optimal adolescent self-regulation, namely, interparental conflict and parental attachment. *Interparental conflict* was measured as perceived by the adolescent, rather than as assessed by the parents. Child perception has been shown to be more salient as a measure of such conflict than the report of the parents (Grych, Seid & Fincham, 1992). Attachment to each parent was also measured as perceived by the adolescent. According to Bowlby (1977, 1988a), affection, warmth and consistent responsiveness are the foundations of

children's attachment experiences with parents. *Self-regulation* was measured as a combination of emotional, cognitive, and behavioral self-regulation scores as rated by each parent and by the adolescent, summing all three individuals' ratings and dividing by three. Four age cohorts were analyzed separately to explore developmental patterns during adolescence. Because interparental conflict was theorized to interact with attachment differently depending on the gender of the parent, attachment in the context of interparental conflict was analyzed as a moderating variable for each parent separately. Prior research suggested that longitudinal assessment of moderators in the link between interparental conflict and child outcomes is essential (Cummings, Davies & Campbell, 2000), so in this study, interparental conflict was assessed at *time 1*, attachment to parents was assessed at *time 2*, and the adolescent's self-regulation was assessed at *times 2, 3, 4, 5 and 6*.

Hypotheses

This study used a latent linear growth model to test the following hypotheses:

- 1) Interparental conflict has a significant association with the *intercept* of adolescent self-regulation.
- 2) Interparental conflict has a significant association with the *slope* of adolescent self-regulation.
- 3) Interparental conflict is predictive of attachment to father and to mother.
- 4) Attachment to father and/or mother is predictive of self-regulation.
- 5) The association of interparental conflict with adolescent self-regulation is moderated by attachment to father and to mother.

Method

Participants and Procedures

Data were taken from a six-wave study of family life in two major areas of the western U.S. (*Flourishing Families*). Participating families were primarily recruited using a purchased national telephone survey database (Polk Directories/ InfoUSA) and were selected from targeted census tracts which mirrored the socio-economic and racial stratification reports of local school districts. All families with a child between the ages of 10 and 13 living within the target areas were deemed eligible to participate and were contacted directly using a multi-stage recruitment protocol. First, a letter of introduction was sent to potentially eligible families. The response rate resulting from this letter was 61%. Second, interviewers made home visits and phone calls to confirm eligibility and willingness to participate in the study. Once eligibility and consent were established, interviewers made an appointment to come to the family's home to conduct an assessment interview. In addition to the random selection protocol described above, families were recruited into the study through family referral of participating families. Follow-up surveys were conducted with participating families each year for the subsequent five years.

This study examined 681 families (72% with married parents and 28% with single parents at *time 1*), analyzing the associations of adolescent self-regulation across five waves of subsequent data collection. At *time 1*, participant adolescents averaged 11.3 years of age (SD = 1.02), 47.9 % female and 52.1% male. At *time 6*, participant adolescents averaged 16.3 years of age, while mothers averaged 48.2 years and fathers averaged 50.3 years. Four hundred eighty-three families (71%) were of European American ethnicity, 60 (9%) were African American, with smaller numbers for Hispanic (< 1%) and Asian American (1%). One hundred eleven families (16%) were categorized as multi-ethnic, based on a combination of two or more

ethnicities among family members, while 3% of the participants did not designate ethnicity. Fourteen families (2%) reported at least one gay, lesbian, or bisexual parent at *time 1*. In terms of parental education, 56% of mothers and approximately 58% of fathers had at least a bachelor's degree. One-fourth (25%) of the families reported an annual income less than \$36,000, while one-fifth (20%) reported income of \$90,000 or more. Nearly one third (31%) reported income in the \$37,000 - \$59,000 range, and one fourth (24%) reported income in the \$60,000 - \$89,000 range. Missing data were detected in less than 6% of cases and the FIML (Full Informational Maximum Likelihood) feature of Mplus (Muthén & Muthén, 2010) was used to estimate models in the presence of missing data.

Measures

At *time 1* adolescents completed measures of perceived conflict between their parents, regardless of whether their parents were married to each other. Only the adolescents' report of their parents' conflict was used as a measure of interparental conflict in this study. At *time 2*, adolescents completed a survey measuring attachment to each parent. At *times 2, 3, 4, 5, and 6*, adolescents and parents assessed the adolescent's emotional, cognitive and behavioral self-regulation by survey, yielding three scores for each adolescent at each of the five times studied. These scores were averaged to obtain a single score for each adolescent at each wave.

Interparental conflict. Interparental conflict was assessed at *time 1* by adolescent-report only, using 5 items of a modified version of the *Children's Perception of Interparental Conflict Scale* (Grych et al., 1992). Adolescents responded to how much they agreed or disagreed with statements such as *I see my parents arguing or disagreeing*, and *They may not think I know it, but my parents disagree a lot*. Responses ranged from 1 (*never true*) to 5 (*always true*), with higher scores representing greater interparental conflict. (The full scale is included in Appendix A.)

Higher scores on items indicate higher levels of adolescent-perceived interparental conflict. The items have been previously shown to be loaded on two components which have been described as *frequency* (items 1, 2, 3, 4, 5, and 6) and *triangulation* (items 8, 9, and 10). The average inter-item correlation for this sample was .36 and Cronbach's α was .87. Regarding current validity, items 1-5 have combined with items from other scales (intensity and resolution scales – Grych et al., 1992) where they have been shown to be significantly related to parent-rated measures of interparental conflict such as Porter and O'Leary's (1980) *O'Leary Porter Scale* (OPS) [$r(81) = .30$] and Straus' (1979) *Conflict Tactics Scale* [$r(78) = .39$]. In this study, as in the Grych et al., 1992 study, items 1-5 were used to assess interparental conflict.

Attachment to parents. The adolescent's attachment to each parent was measured using a modified 8-item version of the *Inventory of Parent and Peer Attachment* (Armsden & Greenberg, 1987), which included items such as *My parent respects my feelings* and *My parent accepts me as I am*. (The full scale is included in Appendix B.) Adolescents responded to how much they agreed or disagreed with the statements. Responses ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Adolescents completed the 8-item scale for each parent. After reverse coding for questions 2, 6, and 7, higher scores indicated a higher degree of attachment between parent and child. Cronbach's α for the research sample was .71 for adolescent report of attachment to mothers and .74 for adolescent report of attachment to fathers. Scores from this inventory correlated significantly with the Moos and Moos (1994) *Cohesion and Expressiveness Scales* ($r = .56$ and $.52$, respectively; $p < .001$).

Self-regulation measures. The instrument used to measure self-regulation was a revised version of scale created by Novak and Clayton (2001 – See Appendix C for the complete original scale which references items used in this study and original items not used in this study). The

revised scale includes assessments of the cognitive, emotional and behavioral constructs of self-regulation. Confirmatory factor analysis compared the original 13-item scale used by Novak and Clayton (2001) to the 12-item scale actually used during waves 3 through 6 of this study and the results indicated that the 12-item scale was as robust as the 13-item scale (See p. 22 of this study). Consequently, only the 12 items of the scale were used. (For more in-depth analysis of the self-regulation measure, see pp. 18-33).

Although a common fates model (Ledermann & Kenny, 2012; Ledermann & Macho, 2014) was considered for this project, such a model would have retained only the portion of the self-regulation reports that was shared by both parents and the adolescent, and this limitation was determined not to be the best model for the hypotheses in this project. The fact that different participants from the same family might rate an adolescent differently was seen to be important information to retain in this project rather than eliminating those differences to obtain a shared value. In this study, the scores for each parent and for adolescent were summed and divided by three, yielding a score for each adolescent at each wave that averaged assessment information from the adolescent and from both parents.

Adolescent ratings. Participant adolescents responded to how much they agreed or disagreed with statements such as *I get distracted by little things, I have difficulty controlling my temper, When I have a goal I make a plan how to reach it*. Responses ranged from 1 (never true) to 4 (*always true*). Higher scores represented the adolescent's ability to regulate emotions, cognitions, and behaviors. Cronbach's Alpha for this measure at *times 2 - 6* ranged from .794 to .851.

Parent ratings. Each parent answered the same self-regulation items completed by the adolescent (with the exception that each question used *my child* language in the place of *I*).

Responses were based on a 4-point Likert-type scale ranging from 1 (*never true*) to 4 (*always true*). Higher scores represented the parents' assessment of their adolescent's ability to regulate emotions, cognitions, and behavior. Cronbach's Alpha for this measure at *times 2 - 6* were found to range between .875 and .889 for mothers and between .860 and .886 for fathers.

Latent growth curve model. Using *Mplus Version 7.11* software (Muthén & Muthén, 2010), a structural equation model was estimated to compare the effects of interparental conflict and attachment to parents on adolescent self-regulation outcomes at *times 2, 3, 4, 5, and 6*, controlling for age cohort (see *Model 4*). Because self-regulation was conceptualized as increasing over time as a result of the adolescent's natural development, a latent growth curve model examined the increase in self-regulation over the five testing periods. The model created for this study accounted not only for the effects of interparental conflict and attachment on adolescent self-regulation, but also for effects on the rate of change in self-regulation over time. This statistical model combined features of factor analysis and latent growth curve models into a single model referred to as a *multiple indicator linear growth model* (Muthén & Muthén, 2010). A measurement model relates a vector of observed indicators to a wave-specific latent self-regulation factor. Each latent self-regulation factor is modeled as a linear function of latent growth parameters, resulting in a linear growth curve model with a latent intercept representing the level of self-regulation at *time 1* and a latent slope describing latent change in self-regulation as a function of time.

Moderator model. Mplus software protocols were used to test the interaction between interparental conflict and attachment to parent for each parent separately using latent variable interactions (Muthén & Muthén, 2010).

Analysis of Raw Self-Regulation Data and of the Self-Regulation Measure

Assumptions of Normality

This analysis of the self-regulation measure used all six time period of data collection, rather than the final five time periods of data used for the analysis of study hypotheses. For this analysis of the measure, there were 147,096 discrete data cells measuring adolescent self-regulation to be examined (681 participant families x 3 participants in each family x 12/13 self-regulation items x 6 waves or times of data collection). Each score was based on a Likert-type scale. All self-regulation scores fell within expected ranges. There were no univariate or bivariate outliers in this data set. For evaluation of skewness and kurtosis, the scales were totaled after reverse coding appropriate items so that higher scores represented greater self-regulation. *Table 1* sets forth the skew values and *Table 2* the kurtosis values for the totaled self-regulation scores.

Table 1

Skewness of Self-Regulation Data, all Times

	Time 1	Time 2	Time 3	Time 4	Time 5	Time 6
Adolescent report	-.120	-.292	-.131	-.352	-.256	-.341
Mother report	-.349	-.365	-.352	-.487	-.449	-.510
Father report	-.430	-.285	-.363	-.342	-.375	-.465

None of these scores exceed 2, the value at which extreme skew should be evaluated (West, Finch, & Curran, 1995). The scores all reflect a slightly negative skew (tending toward the high part of the Likert scale), but the distribution appears not to violate the assumption of normality with respect to skew.

Table 2

Kurtosis of Self-Regulation Data, all Times

	Time 1	Time 2	Time 3	Time 4	Time 5	Time 6
Adolescent-report	.187	.192	.196	.194	.187	.187
Mother-report	.191	.195	.198	.196	.211	.200
Father-report	1.038	.220	.227	.226	.247	.228

None of these scores exceed 7, the value at which extreme kurtosis should be evaluated (West et al., 1995). The scores all reflect slightly positive kurtosis, tending toward a normally-peaked center of the distribution. The score in the table which is unique (father report at *time 1*) reflects the small *N* in this cell (18) compared to the other cells (which approach 680). Father data on all variables was not systematically collected at *time 1*, and this cell represents data collected by fathers who completed the P1 (mother) survey at *time 1* because they were single parent heads of household.

Missing Data

As expected in longitudinal studies, the data collected in the Flourishing Families study experienced considerable attrition over time and was not uniformly monotonic, in that some participants contributed to later data survey times after having missed a previous time. *Table 3* summarizes missing self-regulation data (percentages are in parentheses).

Table 3

Missing Data Summary for Self-Regulation Scores, all Times

	Time 1	Time 2	Time 3	Time 4	Time 5	Time 6
Adolescent-report	6 (0.9)	44 (6.5)	63 (9.3)	50 (7.3)	0 (0)	0 (0)
Mother-report	38 (5.6)	61 (9.0)	81 (11.9)	65 (9.5)	152 (22.3)	85 (12.5)
Father-report	663 (97.4)	199 (29.2)	226 (33.2)	218 (32.0)	295 (43.3)	666 (97.8)

Percentages are shown in parentheses

Of the 18 cells shown above, 14 show more than 5% missing data. Only four of these cells (adolescent report at *times 1, 5, and 6*, and mother report at *time 1*) demonstrate sufficient data for analysis without further evaluation. Planned missingness and consequent imputed data for adolescent report at *times 5 and 6* resulted in the apparent zero missing data in those cells. Most cells, however, require a closer look at missing data patterns. For example, only fathers who were single-parent heads of household were invited to participate in the self-regulation portion of the survey at *times 1 and 6*, with the result that less than 3% of fathers fit this category. As much as 9% of adolescent-reported self-regulation data is missing at *time 3*, 22% of mother-reported self-regulation data is missing at *time 5*, and 43% of father-reported self-regulation data at *time 5*. One reason that father data is missing at a larger rate is that the Flourish Families study purposefully recruited single mothers for the study, anticipating that comparing this family structure with others in the study might yield important comparisons. Such comparisons were conducted in this study.

To evaluate patterns in the missing data, the missingness of mother's report of self-regulation scores was dummy coded and a logistic regression performed with family structure type for each of the six time periods of data collection. *Table 4* gives regression coefficients for

the missing data by family structure type. The asterisks indicate statistical significance, which identifies family structure types whose patterns of missing data are statistically different from the *2-parent married parents* type of family, which was the default type of family structure anticipated by this dummy coding.

Table 4

Missing Data Summary in Mother Reports of Adolescent Self-Regulation, all Times

	Time 1	Time 2	Time 3	Time 4	Time 5	Time 6
2 parent family - separated	1.86	- 0.134	- 0.15	-.310	-.93	.564
2 parent family – cohabiting	0	0.325	- 0.136	.150	-1.21	.593
1 parent family – never married	0.80	- 1.2	-.217	.07	-1.05	.352
1 parent family – divorced	1.74*	0.17	-.125	.07	-.34	1.22*
1 parent family – widowed	2.72*	0	.27	.162	-1.05	1.6*

* $p < .05$

The patterns of missing data significantly associated with family types differing from *2-parent married* appear only at *times 1* and *6*. At these times single-parent families headed by a divorced or widowed parent showed missing patterns significantly different from 2-parent married families. One likely explanation for this difference at *time 1* is that the divorced and widowed families were less likely to include a mother report than the 2-parent families. At *time 6*, the significance of the single parent family missingness suggests that single parent families were more likely to drop out in by *time 6* of data collection. Consequently, self-regulation results that include data from *times 1* and *6* may be less robust with respect to single-parent families than two-parent married families.

Results of Measurement Analysis

Traditional means for testing reliability (Cronbach's alpha and test-retest) were employed in this project. Cronbach alphas are given in *Table 5*.

Table 5

Cronbach's Alpha for Self-Regulation Measure, all Times

	Time 1*	Time 2	Time 3	Time 4	Time 5	Time 6*
Adolescent-report	.785	.779	.800	.800	.807	.771
Mother-report	.869	.874	.879	.874	.889	.889
Father-report	.867	.860	.870	.872	.875	.871

**Times 1 and 6* used a 13-item measure. All other times used 12 items. Dropping item 13 from *time 1* adolescent report resulted in alpha of .77.

None of the calculated alpha values are as robust as the alpha values for the 30-item scale reported in Novak and Clayton (2001). This may reflect the reduced number of items in the Flourishing Families scale or it may reflect the fact that the items selected from the larger measure do not intercorrelate as well as those from the original measure.

Test-retest correlations are given in *Table 6*.

Table 6

Test-Retest Correlations for Self-Regulation Measure

	Time 2	Time 3	Time 4	Time 5	Time 6
Time 1	.793	.768	.705	.673	.633
Time 2		.823	.765	.728	.699
Time 3			.817	.776	.723
Time 4				.829	.765
Time 5					.794

Each assessment of self-regulation correlates at .79 or above with the one immediately before or after it, but correlations with scores obtained beyond one year steadily decline in strength. The observation that scores further away in time from the original testing period are statistically different lends support for the idea of self-regulation as a developmental construct that continues to increase during adolescence.

Analyzing the data with respect to factor analysis, the KMO test yielded a value of .816, indicating that the partial correlations between items were adequate (Kaiser, 1970). The chi-square statistic for the Bartlett test of sphericity was 2422.49 (78 *df*), $p < .001$, indicating that the null hypothesis that the items are not intercorrelated could be rejected. This information suggested that a factor analysis might be useful to further explore the intercorrelations between items.

The construct validity of the self-regulation measure was analyzed with STATA for adolescent-report at *time 1*, following the recommendations of McDonald and Ho (2002) and Kline (2005) to report both baseline (uncorrelated) fit indexes and incremental fit indexes. The sample size for the analysis was 675. The model was identified, in that 13 variables were

provided to the model ($13 \times 14/2 = 91$), resulting in 91 variance/covariance values and 26 parameters estimated by the model: 12 factor loadings, 13 factor error variances and one latent variable variance, resulting in 65 degrees of freedom. Missing data in the self-regulation scores implies that means should be calculated for the 13 indicators, leaving 52 degrees of freedom in the baseline model. Despite being identified, the initial baseline fit was poor. The model was adjusted by multiple attempts as set forth in *Table 7*, with the final result being a model with excellent fit.

Table 7

Model Fit Indices for Self-Regulation at Time1 Including Incremental Changes

Comment	Chi-sq	<i>p</i> value	Degrees of Freedom	RMSEA	CFI	TLI
Baseline Model	1081.11	<.001	52	.152	.571	.485
Cov e.11*e.12 Both reference <i>sitting still</i>	826	<.001	51	.133	.678	.608
Cov e.6*e.8 Both reference <i>goals</i>	605	<.001	50	.113	.771	.716
Cov e.9*e.13 <i>Distraction/Nervous energy</i>	567.72	<.001	49	.110	.786	.731
Cov e.7*e.10 Both reference <i>Consequences</i>	483.73	<.001	48	.101	.821	.731
Cov e.12*e.13 Both reference <i>sitting still</i>	451.42	<.001	47	.098	.838	.785
Cov e.11*e.13 Both reference <i>sitting still</i>	328.89	<.001	46	.082	.886	.849

Cov e.6*e.7 Both reference the future	306.85	<.001	45	.080	.895	.859
Cov e.7*e.8 Both reference <i>plans/goals</i>	251.98	<.001	44	.07	.92	.89
Cov e.6*e.10 Both reference Controlling <i>plan/goal</i>	221.20	<.001	43	.066	.93	.91
Cov e.8*e.10 Both reference <i>planning</i>	134.62	<.001	42	.046	.966	.952
Cov e.9*e.11 <i>Fidgety/distracted</i>	119.27	<.001	41	.042	.972	.960
Cov e.9*e.12 Distracted/hard to <i>sit still</i>	85.86	=.003	40	.030	.986	.980
Cov e.7*e.12 Consequences Of Actions/ <i>Hard to sit still</i>	73.86	=.025	39	.025	.991	.986
Cov e.1*e.2 <i>Temper/explode</i>	65.06	=.089	38	.02	.994	.991

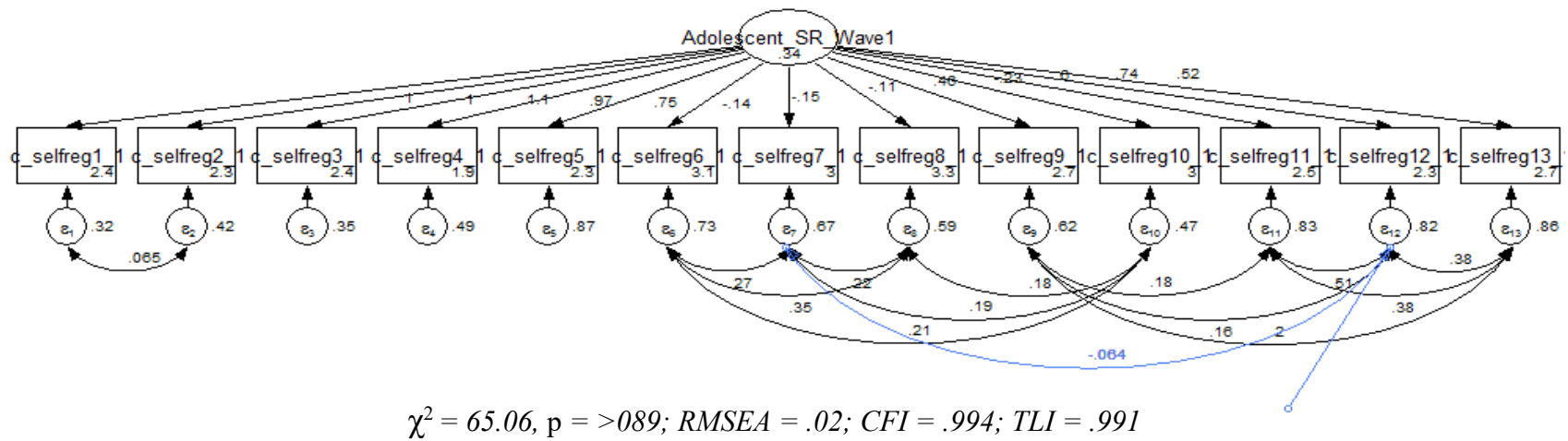


Figure 1. Measurement model of adolescent report of self-regulation, time 1, unstandardized.

Table 8

Factor Scores for Measurement Model of Adolescent Report of Self-Regulation, Time 1

	Factor Score (Unstand.)	Standard Error	<i>z</i>	<i>p</i> Value	95% CI
SR 1	1 (constrained)				
SR2	1.03	.062	16.61	0.00	.912 – 1.16
SR3	1.12	.074	15.08	0.00	.978 – 1.27
SR4	.970	.071	13.49	0.00	.829 – 1.11
SR5	.752	.078	9.63	0.00	.599 – .905
SR6	-.143	.063	-2.26	.024	-.267 – -.019
SR7	-.149	.061	-2.46	.014	-.269 – -.030
SR8	-.105	.057	-1.87	.062	-.217 – .005
SR9	.462	.062	7.34	0.00	.339 – .585
SR10	-.233	.052	-4.50	0.00	-.334 – -.131
SR11	.596	.073	8.09	0.00	.451 – .740
SR12	.738	.076	9.66	0.00	.588 – .888
SR13	.516	.074	7.00	0.00	.372 – .661

All the factor loadings listed in *Table 8* were significant at $p < .05$, with the exception of SR 8. The strength of the factor scores, however, was not uniformly sufficient. Less than 20% of the variance in *items 6, 7, and 8* were explained by the latent construct of adolescent self-regulation, and less than 30% of the variance in item 10 was explained by the latent construct. These indicators appear weakly related to the latent construct, and elimination of them might be considered.

Pursuant to the Flourishing Families codebook (Day et al., 2012), the items of the self-regulation measure reflect three subscales: emotional self-regulation, cognitive self-regulation, and behavioral self-regulation. *Items 1 - 6* were designed to capture emotional self-regulation, *items 7 - 9* represent cognitive self-regulation, and *items 10 - 13* approximate behavioral self-regulation. Based on the factor scores and covariances in the measurement model, it appeared that some items could load more strongly on constructs other than the one which they were intended to load. *Item 6*, for example does not appear related to *1-5* as much as it is related to *7* and *8*. In addition, *items 6 through 9* suggest overlap in loading with *items 10 through 12*. Accordingly, a *preliminary* factor analysis with regard to this measure was performed using the adolescent report of self-regulation at *time 1*. A preliminary screeplot suggested three factors could be obtained (See *Figure 2*). The preliminary factor analysis also identified three factors, as set forth in *Table 9*.

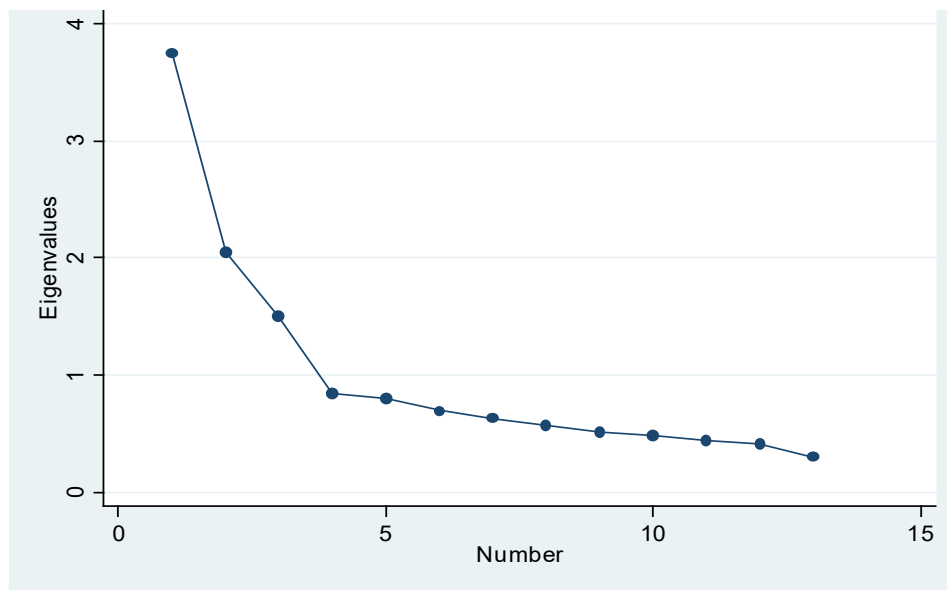


Figure 2. Screeplot of eigenvalues after factor identification of self-regulation data, *time 1*.

Table 9

Component Analysis of Self-Regulation Data, Time 1

	Factor 1	Factor 2	Factor 3	Uniqueness
SR 1	.66		.40	.33
SR 2	.67			.38
SR 3	.67			.37
SR 4	.60			.49
SR 5	.48			.73
SR 6		.73		.37
SR 7		.64		.50
SR 8		.72		.40
SR 9	.50			.65
SR 10		.58		.52
SR 11	.64		-.55	.28
SR 12	.70		-.47	.29
SR 13	.57		-.54	.38

Although three factors were extracted with eigenvalues larger than 1, no item loaded more strongly on the third factor than on one of the other two factors suggesting that this rotation may not be ideal for these items. A varimax rotation was then performed, which yielded the following values listed in *Table 10*.

Table 10

Varimax Rotation of Preliminary Factor Analysis, Adolescent Self-Regulation, Time 1

	Factor 1	Factor 2	Factor 3
SR 1	.81		
SR 2	.77		
SR 3	.77		
SR 4	.70		
SR 5	.48		
SR 6			.79
SR 7			.70
SR 8		.78	.77
SR 9		.55	
SR 10			.68
SR 11		.83	
SR 12		.80	
SR 13		.78	

In this factor analysis, item 8 failed to load on a single factor, loading instead on both factor 2 and factor 3. A promax rotation was then performed which resulted in the factor analysis listed in *Table 11*.

Table 11

Promax Rotation of Preliminary Factor Analysis, Adolescent Self-Regulation, Time 1

	Factor 1	Factor 2	Factor 3
SR 1	.83		
SR 2	.77		
SR 3	.78		
SR 4	.72		
SR 5	.47		
SR 6			.79
SR 7			.70
SR 8			.78
SR 9		.55	
SR 10			.68
SR 11		.85	
SR 12		.80	
SR 13		.81	

This factor analysis produced a structure where each item loaded on one and only one factor, which was an ideal structure. This factor analysis supported a three factor-model of self-regulation derived from the self-regulation assessment as follows:

Factor 1

- I have a hard time controlling my temper. (1)
- I get so frustrated I feel ready to explode. (2)
- I get upset easily. (3)
- I am afraid I will lose control over my feelings. (4)
- I slam doors when I am mad. (5)

Factor 2

- I develop a plan for all my important goals. (6)
- I think about the future consequences of my actions. (7)
- Once I have a goal, I make a plan to reach it. (8)
- As soon as I see that things are not working, I do something about it. (10)

Factor 3

- I get distracted by little things (9)
- I get fidgety after a few minutes if I am supposed to sit still (11)
- I have a hard time sitting still during important tasks (12)
- I find that I bounce my legs or fiddle with objects (13).

The promax rotation supported a three-factor model that corresponds to emotional self-regulation (Factor/Subscale 1), cognitive self-regulation (Factor/Subscale 2) and behavioral self-regulation (Factor/Subscale 3). A three factor/subscale model was also anticipated by the Flourishing Families codebook (Day et al., 2012). However, the codebook indicated that *item 10* (*As soon as I see something is not working, I do something about it*) should load on the behavioral subscale, while the promax rotation indicated it should load strongly on the cognitive subscale and only on the cognitive subscale.

Future Research Regarding Self-Regulation Measures

Future studies should examine the construct validity of the emotional, cognitive and behavioral subscales of self-regulation used in the Flourishing Families research project. Questions that capture the core of the construct more effectively than those in this measure seem likely and should be explored. For example, getting upset easily (SR2) may not be as important

in self-regulation as being able to calm oneself when upset as a result of the ability to return to baseline physiology is likely a more salient measure of physiological self-regulation than how easily/frequently a person is emotionally distressed. The items used to assess cognitive self-regulation appear to have a weak relationship with the overall latent construct of self-regulation, which makes sense considering that the questions intended to measure cognitive self-regulation are primarily about planning to accomplish goals and considering consequences of actions. Cognitive self-regulation appears more likely to relate to the overall construct of self-regulation by assessing the quality of self-talk an adolescent uses to soothe herself when she is anxious, for example, than whether she makes plans to reach her future goals.

Analysis of Response Rates for Interparental Conflict and Attachment Data

Table 12 gives the response rates for the latent constructs of interparental conflict, attachment to parents and self-regulation. *Table 13* gives the response rates for the individual items used to form the latent constructs of interparental conflict, father attachment and mother attachment. Father attachment scores are missing at a higher rate than mother attachment scores because the study purposefully recruited single-parent families which were primarily families headed by mothers. In *Table 13*, only the father attachment cells which reflect purposeful missingness show missing data in excess of 5%. All mother attachment scores show missingness less than 2% and interparental conflict scores show missingness less than 1%. It is interesting that the adolescents in the single-parent families generally provided interparental conflict scores despite not providing scores on attachment to father. Perhaps these adolescents were aware of their mother's conflict with an unrelated adult and reported this as interparental conflict, or perhaps these adolescents reported on their mother's conflict with fathers with whom the adolescents did not have sufficient relationship to attempt an assessment of their attachment.

Table 12

Response Rates for Interparental Conflict, Attachment to Parents, and Self-Regulation

	Time 1	Time 2	Time 3	Time 4	Time 5	Time 6
Interparental Conflict	681 (1.5)					
Attachment to Mother	681 (0.001)					
Attachment to Father	681 (10.1)					
Self-Regulation Adolescent Report		644 (5.4)	622 (8.7)	633 (7.0)	681 (0)	680 (.1)
Self-Regulation Mother Report		644 (5.4)	623 (8.5)	635 (6.8)	623 (8.5)	597 (12.3)
Self-Regulation Father Report		470 (31.0)	441 (35.2)	448 (34.2)	436 (36.0)	453 (33.5)

N values with missing percentages in parentheses

Table 13

Interparental Conflict and Attachment to Parents Response Rates for Individual Items, Time 1

	Interparental Conflict	Father Attachment	Mother Attachment
Item 1	670 (1.6)	611 (10.3)	679 (.3)
Item 2	669 (1.8)	609 (10.6)	678 (.4)
Item 3	671 (1.5)	612 (10.1)	679 (.1)

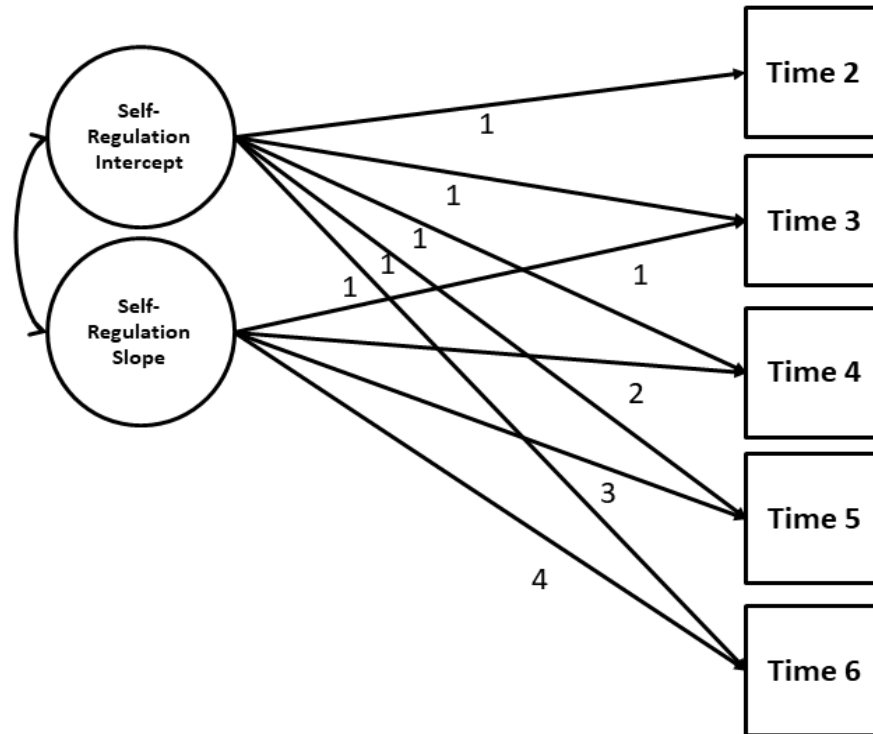
Item 4	670 (1.6)	610 (10.4)	679 (.3)
Item 5	670 (1.6)	610 (10.4)	679 (.3)
Item 6		611 (10.3)	680 (.1)
Item 7		610 (10.4)	680 (.1)
Item 8		611 (10.3)	680 (.1)

N values with missing percentages in parentheses

Model Analysis

Model 1: Growth Curve of Adolescent Self-Regulation Across 5 Time Points

Model 1 illustrates the growth curve model that was used to analyze change in self-regulation over five years from adolescence to early adulthood.



$$\chi^2 = 82.118, df 19 (p < .001), RMSEA = .07, CFI = .96$$

Because the self-regulation data for *times 2 – 6* reflects the average of the report of each parent and the adolescent at each time, *Table 14* shows the correlations between assessments of self-regulation for adolescents and their parents for the self-regulation data at *time 2*.

Table 14

Correlations Between Self-Regulation Assessments of Adolescent and Parents, Time 2

	Adolescent Self-Assessment	Mother Assessment	Father Assessment
Adolescent Self-Assessment	1.0	0.461*	0.407*
Mother Assessment	0.461*	1.0	0.652*
Father Assessment	0.407*	0.652*	1.0

* $p < .01$

Table 15 displays the means of self-regulation at each time period and also gives means for each of four age cohort groups for the five time periods. *Figure 3* graphs the self-regulation means by year of survey. Because at each time period a cross section of ages were surveyed, *Figure 4* adjusts the data given in *Figure 3* to represent the means when each cohort is the same age. *Table 16* gives the standardized factor loadings for the self-regulation scores. At *time 2* (the first time self-regulation was measured), the intercept of self-regulation for the four age groups ($N = 681$) was 2.85 (SE .017). The slope of self-regulation was 0.013 (SE .005, $p < .05$), indicating a small but significant increase in self-regulation scores over the five years of the study (four age groups over four years of measurement = 16 discrete time periods measured). For 15 of the 16 time periods measured, self-regulation demonstrated a steady rise through the period. However, for participants who began the study at age 9 - 10 (the youngest cohort, $N = 157$), the average level of self-regulation decreased during one of the time periods (*time 4* to *time 5*), and then increased during the last time period (*time 5* to *time 6*) even above *time 4* levels (See *Figure 3*). Participants who began the study at age 13 - 14 ($N = 106$) reported lower levels of

self-regulation at each time period over the duration of the study than those who were 12 at the beginning of the study ($N = 172$), although they also followed the general trend of demonstrating increasing levels of self-regulation at each time period studied.

To test for any systematic pattern of variation in self-regulation scores, a quadratic model was applied, but did not fit this data when all age cohorts were combined. Despite the general upward trend of all self-regulation scores over the five time periods, a spaghetti plot revealed wide variation in individual self-regulation scores.

The correlation between the intercept and the slope of self-regulation was found to be $r = -0.439$ (SE .042, $p < .001$), suggesting that self-regulation scores that were higher at the first time measured increased less over time than the self-regulation scores that were lower at the first time measured. *Table 15* and *Figures 3 - 6* represent descriptive statistics regarding this data, and are not drawn from the Mplus analysis.

Table 15

Average Self-Regulation Scores by Time Period and Age Group (Unstandardized)

Cohort (N)	Time 2 Mean (SE)	Time 3 Mean (SE)	Time 4 Mean (SE)	Time 5 Mean (SE)	Time 6 Mean (SE)
All Ages (681)	2.85 (.016)	2.88 (.017)	2.89 (.016)	2.92 (.017)	2.99 (.017)
Age 9-10 (157)	2.81 (.032)	2.83 (.034)	2.84 (.035)	2.82 (.037)	2.90 (.036)
Age 11 (246)	2.85 (.026)	2.88 (.028)	2.89 (.027)	2.92 (.027)	2.99 (.028)
Age 12 (172)	2.86 (.033)	2.93 (.032)	2.94 (.033)	2.94 (.034)	3.02 (.034)
Age 13-14 (106)	2.85 (.046)	2.89 (.045)	2.91 (.042)	2.92 (.043)	3.00 (.042)

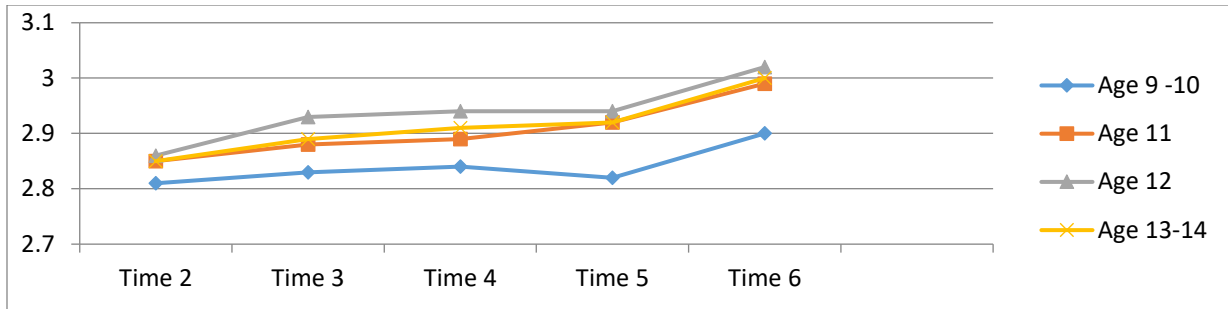


Figure 3. Cohort self-regulation means over the five survey times.

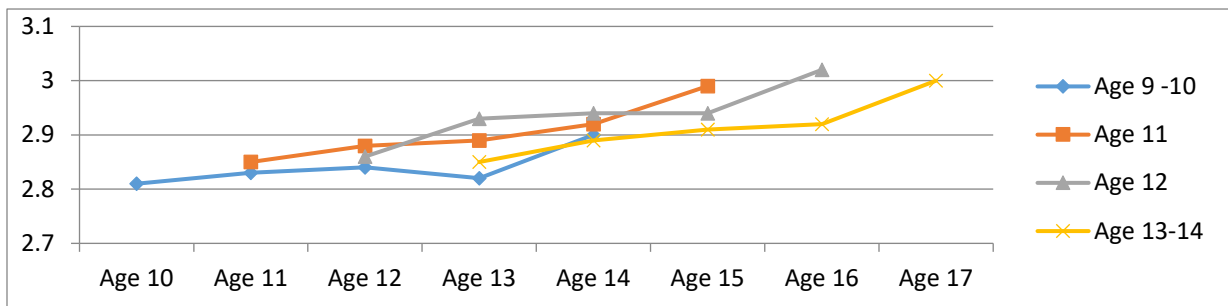


Figure 4. Cohort self-regulation means adjusted for age matching.

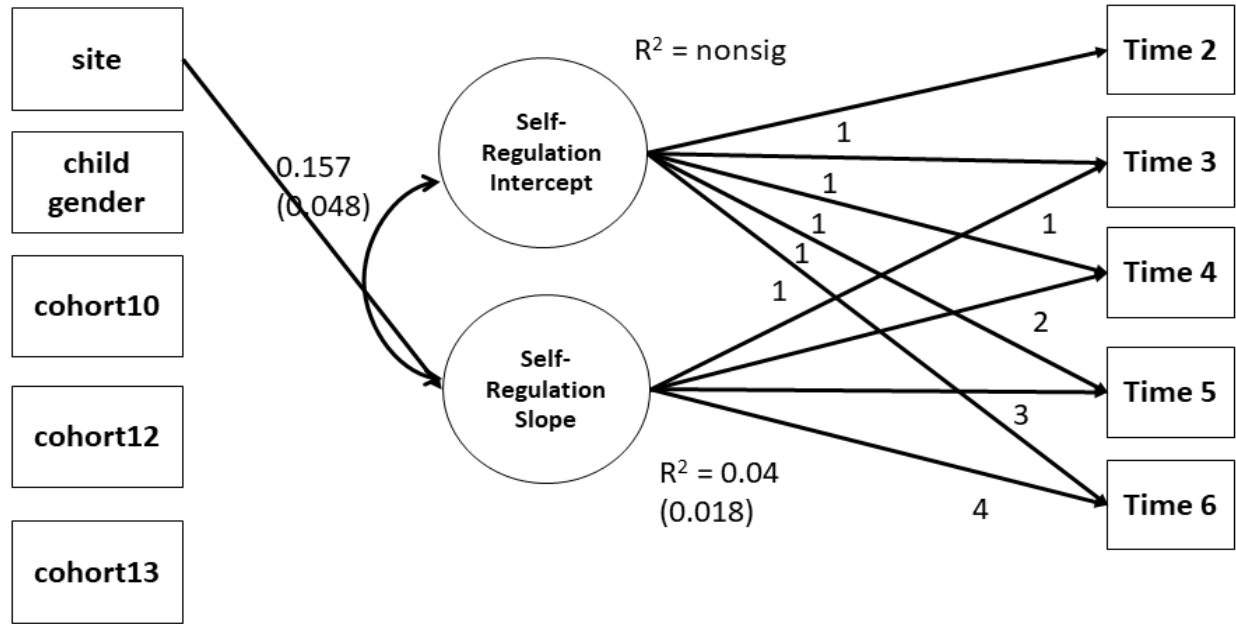
Table 16

Factor Loadings for Adolescent Self-Regulation Scores (Standardized)

Time Period	Factor Loading	Standard Error	<i>p</i> Value (Two-Tailed)
Time 2	0.840	0.017	0.000
Time 3	0.876	0.021	0.000
Time 4	0.901	0.026	0.000
Time 5	0.870	0.030	0.000
Time 6	0.828	0.035	0.000

Model 2: Standardized Regression Coefficients Predicting Intercept and Slope of Adolescent Self-Regulation

Gender, age cohort and site (geographic location) were added to the growth curve model as control variables for *Model 2* analysis.



$\chi^2 = 86.94, df 25 (p < .001), RMSEA = .06, CFI = .96$

None of these control variables was found to be significantly related to the intercept of self-regulation, but site (first city $N = 181$ and second city $N = 500$) was significantly related to the slope of self-regulation ($b = .037, SE .011 p < .005$). These results suggest that although the two cities' participants did not significantly differ from each other in initial self-regulation scores, and although scores from both cities tended to rise over the duration of the study, the participants' scores in the first city tended to increase at a faster rate over the five years of the study than did those of the second city (See *Figure 5*). Descriptive means were used to create

Figure 6, which illustrates differences in self-regulation means by adolescent gender across the five time periods. These differences were not found to be significant.

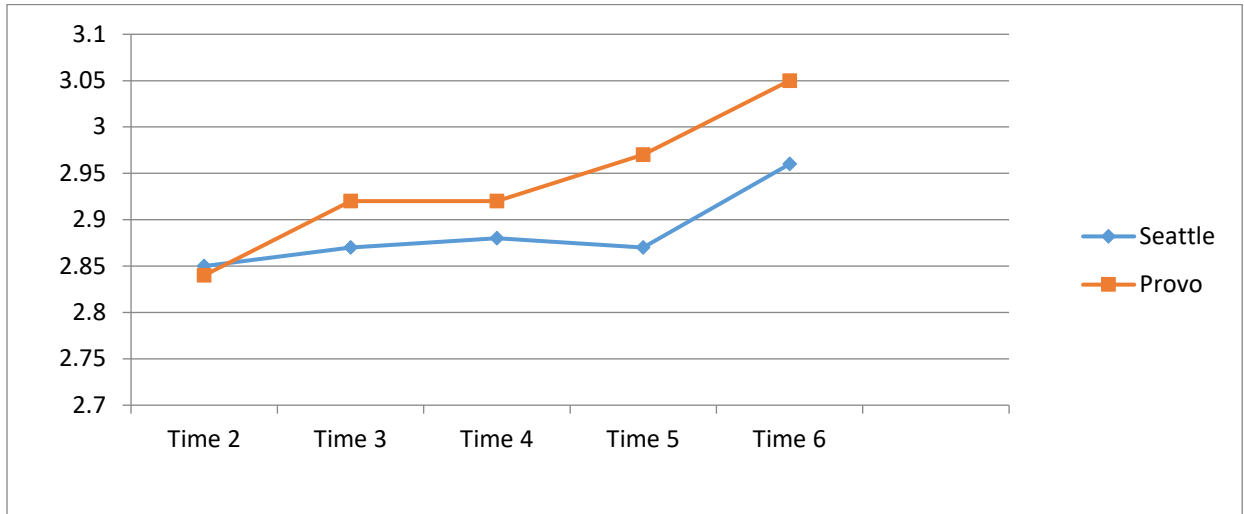


Figure 5. Self-regulation scores by site across five time periods.

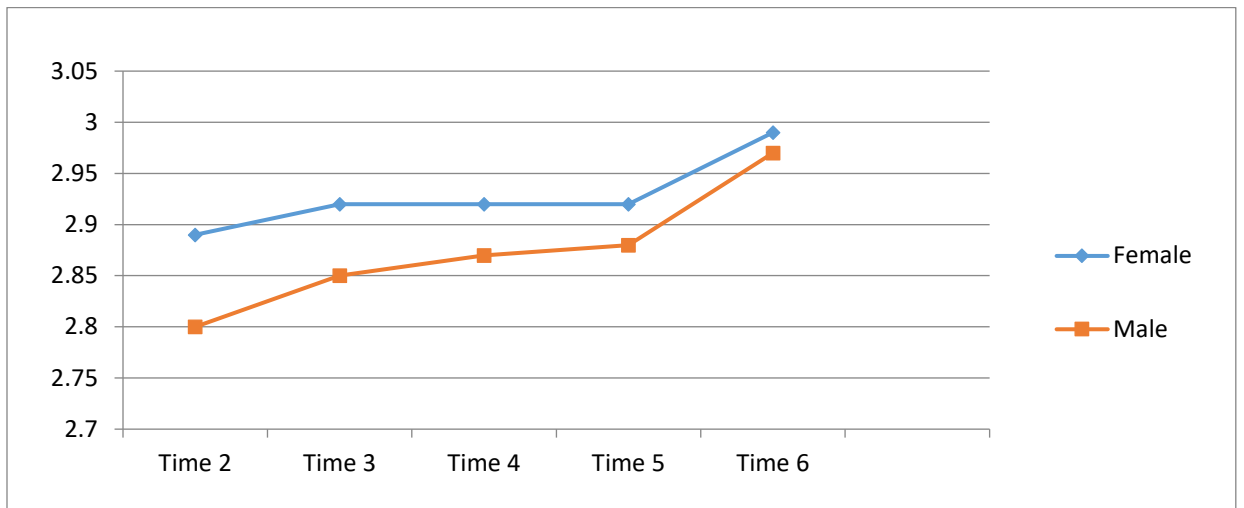
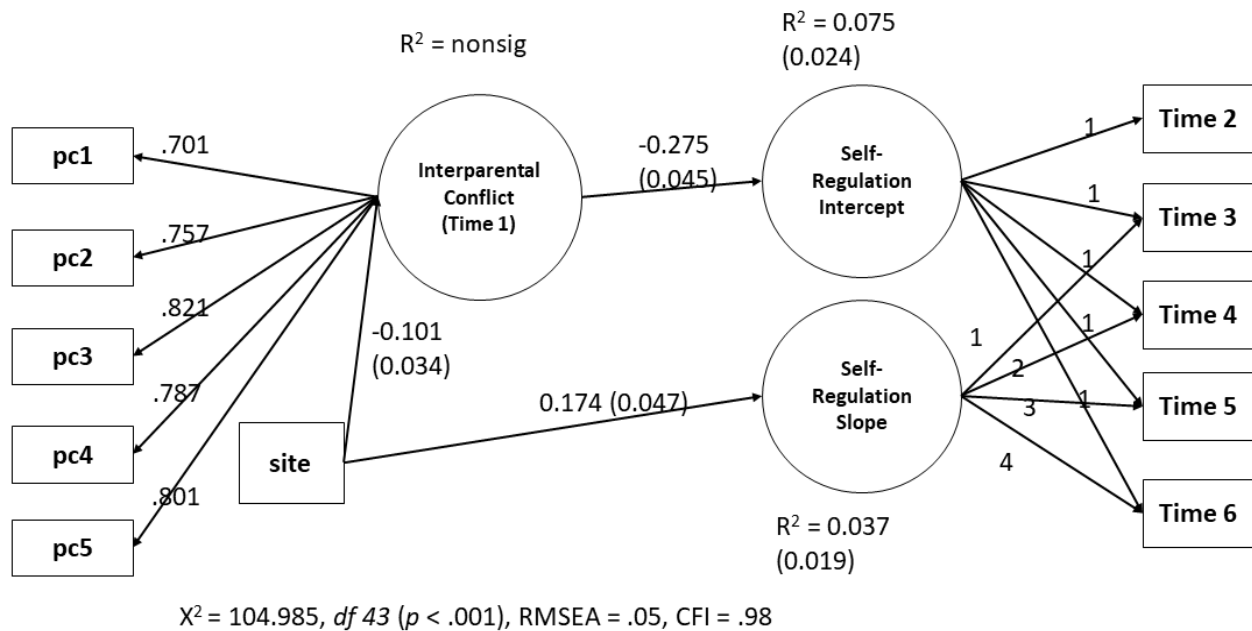


Figure 6. Self-regulation means by gender across five time periods.

Model 3: Main Effects A: Interparental Conflict and Site Predicting Intercept and Slope of Adolescent Self-Regulation

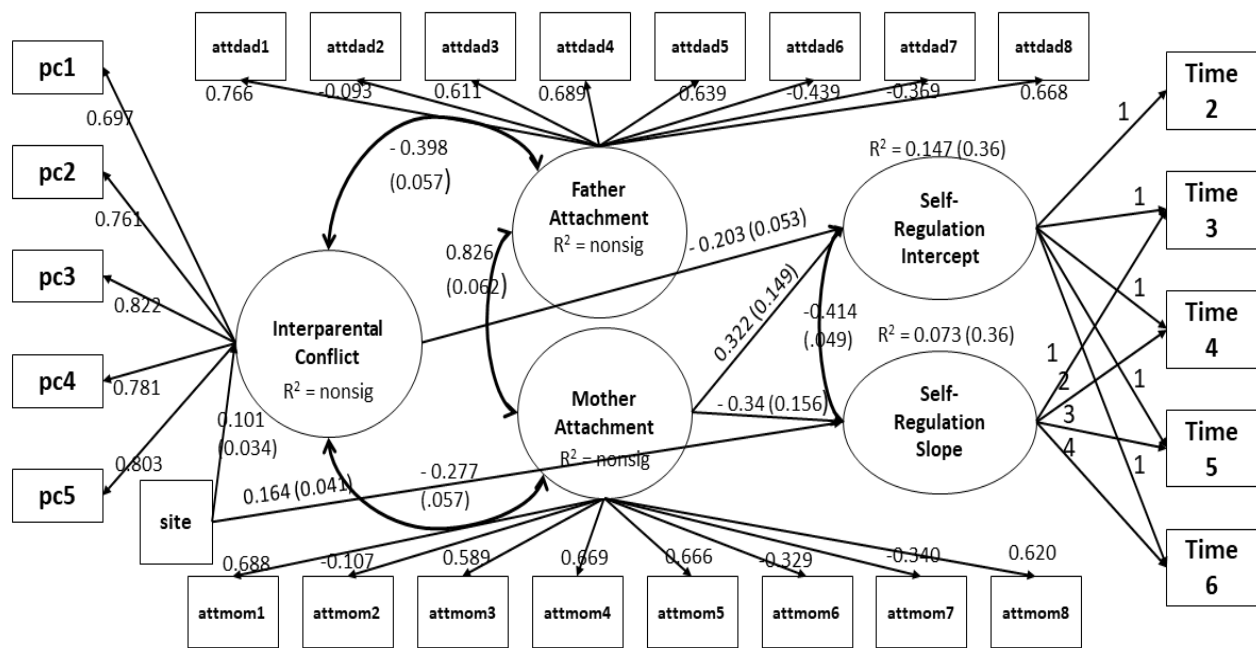


To investigate the potential relationship between interparental conflict and adolescent self-regulation over time, interparental conflict was entered into *Model 3* as an independent variable. The analysis estimated the effect of interparental conflict on the intercept of self-regulation as $\beta = -.275$ ($SD .045, p < .001$), suggesting that higher levels of interparental conflict were predictive of lower self-regulation scores at the first time measured. Interparental conflict demonstrated no significant relationship with the slope of self-regulation.

Because gender and age cohort were not predictive of self-regulation in *Model 2*, they were not included as control variables in *Model 3*. Site was maintained as a control variable, and continued to predict the slope of self-regulation as $\beta = 0.174$ ($SD .047, p < .001$) although (as in

Model 2) it did not predict the intercept of self-regulation. Site also predicted interparental conflict scores at $\beta = -0.101$ ($SD .034, p < .005$), suggesting that interparental conflict scores in the second city were lower (representing less conflict) than those of the participants in the first city.

Model 4: Main Effects B: Parental Attachment and Interparental Conflict Predicting Intercept and Slope of Adolescent Self-Regulation.



Model Fit Info: Absolute model fit statistics are not available for this type of model in Mplus. Loglikelihood H0 Value = -17826.409, H0 Scaling Correction Factor = 1.5586, Akaike (AIC) = 35826.818, Bayesian (BIC) = 36220.368, Sample-Size Adjusted BIC = 35944.132

To investigate the potential relationships between interparental conflict, parental attachment and adolescent self-regulation over time, *attachment to father* and *attachment to mother* were entered into the growth curve model as independent variables together with interparental conflict (See Model 4). This model estimated the effects of interparental conflict and attachment to each parent on the intercept and slope of adolescent self-regulation. Only site

was used as a control variable in this model because neither gender nor age cohort demonstrated a significant correlation with the intercept or slope of self-regulation in earlier models.

Correlations between the independent variables in this model are shown in *Table 17*.

Table 17

Correlations Between Model 4 Independent Variables

	Interparental Conflict	Attachment to Mother	Attachment to Father	Site
Interparental Conflict	1.0			
Attachment to Mother	-0.132**	1.0		
Attachment to Father	-0.250**	0.730**	1.0	
Site	-0.096**	NS	NS	1.0

** $p < .001$

Father attachment demonstrated significant correlation with interparental conflict ($r = -.250, p < .001$), suggesting that as interparental conflict increases, father attachment decreases. Mother attachment also demonstrated significant correlation with interparental conflict ($r = -.132, p < .001$), suggesting that as interparental conflict increases, mother attachment decreases, although it does not decrease as much as father attachment. Although it is possible to conceptualize that an adolescent's attachment to a parent has some predictive effect on the parents' conflict with each other, this study hypothesizes that interparental conflict has a predictive effect on adolescent attachment to parents. Tension involved in interparental conflict may reduce the adolescent's attachment to the people who are perceived to cause tension. These findings warrant further analysis to determine whether attachment to parents has a predictive

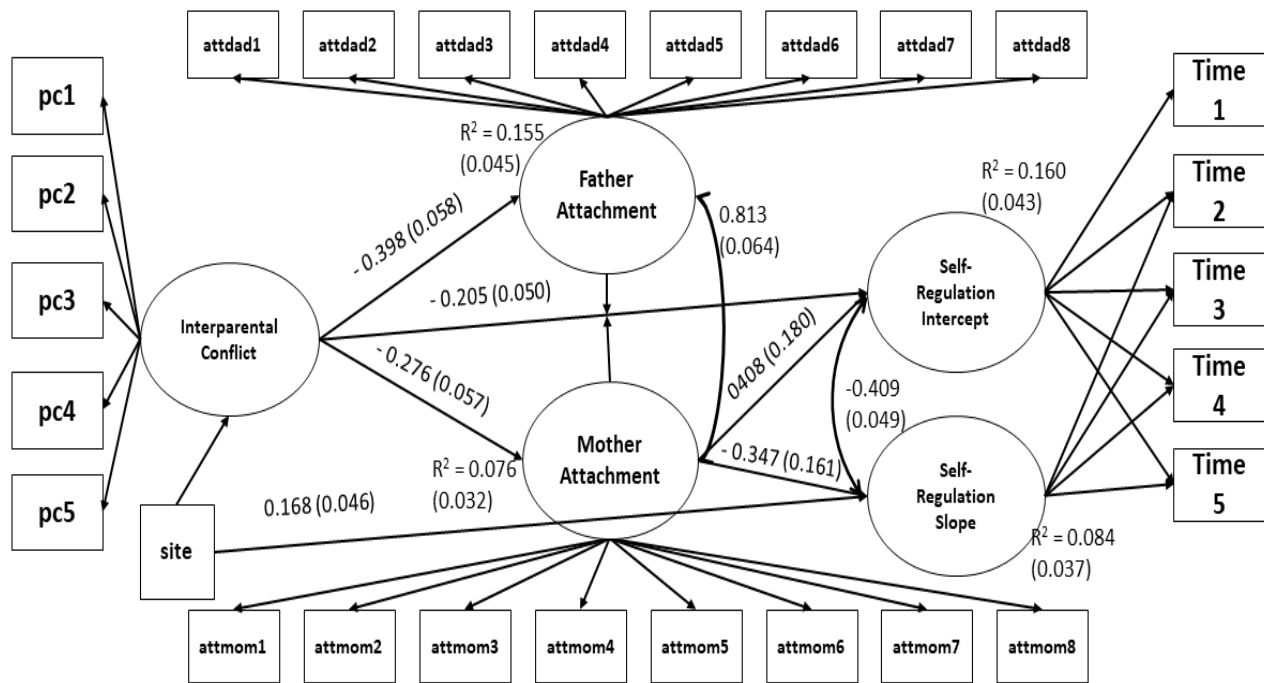
effect on interparental conflict and whether the apparent increased negative impact of interparental conflict on father attachment compared to mother attachment is statistically significant.

This model estimated the effect of mother attachment on the intercept of adolescent self-regulation as $\beta = 0.322$ ($SE .15, p < .05$), suggesting that higher mother attachment scores were associated with higher self-regulation scores at the first time self-regulation was measured. Mother attachment scores also predicted the slope of self-regulation at $\beta = -.340$ ($SE .16, p < .05$), suggesting that self-regulation scores for those with higher mother attachment scores decreased and became more similar at *time 6* to those who began with lower scores on mother attachment. In other words, the self-regulation scores of all participants tended to become more similar across time, and those who began the study with lower self-regulation scores tended to increase at a greater rate over the five years of the study as they became more similar to the self-regulation scores of those who began with higher mother attachment scores. This phenomenon is described as the Wilder's law of initial value (Wilder, 1962), which states that when an initial value of a variable is high, there is often a drop in the value of the variable over time, and when there is a low initial value to the variable, that value often increases over time, resulting in a statistical artifact that does not accurately represent trends in the data. Attachment to father demonstrated no significant association with either the slope or intercept of self-regulation.

Including mother attachment in this model reduced the strength of the relationship between interparental conflict and the intercept of adolescent self-regulation (*Model 3*) from $\beta = -.275$ ($SD .045, p < .001$) to $\beta = -.203$ ($SD .053, p < .001$), suggesting that mother attachment explained some of the variation in the intercept of self-regulation seen in *Model 3*. The *R*-squared statistic for the self-regulation intercept is $R^2 = .147$ ($SE .036, p < .001$),

suggesting that 15% of the variability in the intercept of adolescent self-regulation is explained by this model. The R -squared statistic for the self-regulation slope is $R^2 = 0.084$ (SE .037, $p < .001$), suggesting that 8% of the variability in the slope of adolescent self-regulation is explained by this model.

Model 5: Attachment as Moderator of the Relationship Between Interparental Conflict and Adolescent Self-Regulation



Model Fit Info: Absolute model fit statistics are not available for this type of model in Mplus. Loglikelihood H0 Value = -17653.371, H0 Scaling Correction Factor for MLR = 1.6436, Akaike (AIC) = 35486.742, Bayesian (BIC) = 35893.863, Sample-Size Adjusted BIC = 35608.102.

Because interparental conflict appeared to predict adolescent attachment to father and to mother, and because both interparental conflict and attachment to mother appeared to predict adolescent self-regulation (see *Model 4*), a moderation model that conceptualized an interaction

between interparental conflict and attachment to each parent was analyzed (See *Model 5*).¹ Separate latent variable interactions for interparental conflict and attachment were created for father and mother. In this model, only site was used as a control variable because cohort and adolescent gender were not found to be significantly related to study variables in prior models.

As observed in prior models, interparental conflict predicted the intercept of adolescent self-regulation ($\beta = -.205$, $SD .05$, $p < .001$). Interparental conflict also predicted attachment to father ($\beta = -.393$, $SD .058$, $p < .001$) and attachment to mother ($\beta = -.276$, $SD .057$, $p < .001$). However, neither the interaction between father attachment and interparental conflict nor the interaction between mother attachment and interparental conflict were found to be significant in predicting adolescent self-regulation. As in *Model 4*, only mother attachment predicted the intercept of adolescent self-regulation ($\beta = .408$, $SD .18$, $p < .05$). Father attachment did not significantly predict adolescent self-regulation.

The R -squared statistic for the self-regulation intercept for this model is $R^2 = .16$ ($SE .043$, $p < .001$), suggesting that 16% of the variability in the intercept of adolescent self-regulation is explained by this model. The R -squared statistic for the self-regulation slope for this model is $R^2 = 0.084$ ($SE .037$, $p < .05$), suggesting that 8% of the variability in the slope of adolescent self-regulation is explained by this model.

Discussion

The present study extends work investigating the associations between interparental conflict, attachment and adolescent outcomes. Using data from 681 families in the Flourishing

¹ A *mediation* model for this data set (using 4 time periods), wherein the negative relationship between interparental conflict and adolescent self-regulation is mediated by the adolescent's attachment to parents, was analyzed by this author in her 2012 Master's Thesis (BYU). See Hansen (2012).

Families study, associations between interparental conflict, mother and father attachment, and initial and growth levels of adolescent self-regulation were analyzed across five time points. This study demonstrated that adolescent self-regulation in this population showed steady growth across five time periods during adolescence, suggesting that self-regulation may continue to develop generally throughout adolescence, a finding not revealed in prior research. Adolescent self-regulation increased significantly more in adolescents in the first city over the five years of the study than in participants from the second city. Interparental conflict predicted lower adolescent self-regulation scores initially, confirming prior research, but interparental conflict did not depress the rate at which adolescent self-regulation developed. As interparental conflict increased, attachment to parents decreased. No moderation effects were found for the interaction of interparental conflict and attachment to parents regarding adolescent self-regulation.

The significant and general trend of all self-regulation scores was to increase slightly during each year for adolescents in all age cohorts over the five years of the study. This overall increase in self-regulation scores was observed regardless of adolescent gender or at which of the two sites data was collected. No prior studies were found acknowledging self-regulation as a construct that continues to develop during adolescence. Numerous studies have demonstrated that self-regulation increases from age 2 through age 8 or 9, but these studies have not attempted to determine whether self-regulation continues to increase during adolescence (Raffaelli et al., 2005; Sawyer et al., 2015). Consequently, self-regulation has been previously conceptualized as a persistent and stable construct of personality which reaches a developmental plateau by early adolescence (Carlo et al., 2012; Kobak et al., 1993; Trentacosta & Shaw, 2009). The large number of participants in this study ($N = 681$) and the generally consistent positive slope of all adolescent age cohorts over the five years of the study for participants in two different U.S.

locations adds support for self-regulation as a construct that continues to develop throughout adolescence. Rather than assuming that self-regulation is set after childhood, clinicians may use this finding to see the adolescent as still developing the ability to self-regulate.

Gender. This study found that self-regulation was not significantly predicted by the adolescent's gender. It should be noted that in this study self-regulation scores were obtained by adolescent self-report. There is some indication that self-regulation scores obtained from boys' self-assessments are somewhat higher than scores obtained from assessments by the boys' parents (Hansen, 2012).² In the 2012 study, adolescent boys' and girls' assessments of self-regulation did not differ significantly from each other, despite the parents' generally rating girls as having higher self-regulation than boys.³ In another prior study (Hrbackova & Vavrova, 2015), adolescent self-regulation scores for boys and girls did not differ, nor did they differ significantly from assessments by key adults. Further review of gendered differences in self-regulation scores is needed to discover if scores do not differ by gender because 1) boys' and girls' self-regulation behaviors (emotional, cognitive, and behavioral) do not actually differ and thus are assessed accurately by the adolescents; or 2) boys assessed themselves as higher at self-regulation than girls did despite boys' self-regulation behaviors not meriting a higher assessment.

Site. Most results in this study showed no differences between the two data collection sites (first city $N = 181$ and second city $N = 500$). Site did not predict the intercept of adolescent self-regulation nor did it predict attachment to mother or to father. Site was weakly correlated

² Parental assessment of adolescent girls' self-regulation in the same study did not differ significantly from girls' self-assessments.

³ If parents are more likely to see girls as demonstrating better self-regulation, this may be because 1) girls are developmentally more able to accomplish self-regulatory tasks than boys; 2) the construct of self-regulation favors tasks at which girls generally excel; 3) parents expect their sons to demonstrate more self-regulation than they do girls and are more cognizant of boys' deficits; or 4) parents are less likely to see their sons as self-regulated for other reasons.

with interparental conflict, suggesting that the first city's interparental conflict scores were slightly higher than those of the second city. Site also predicted the slope of adolescent self-regulation, suggesting that adolescents living in the first city increased self-regulation scores over the five years of the study more than did the adolescents living in the second city. At the end of the five years of the study, the second city's adolescent self-regulation scores averaged 2.96 (out of 5), and the first city's adolescent scores averaged 3.05 (out of 5), a difference of .090. For comparison purposes, the average increase in self-regulation during a year's time for all age cohorts was 0.013. No known studies have suggested a reason for this difference in the rate of self-regulation differences between these two cities. Perhaps variables such as altitude, religion, or family role emphasis play a part in provoking higher levels of interparental conflict and/or promoting more rapid development of adolescent self-regulation.

Interparental conflict as a predictor of adolescent self-regulation. While previous research demonstrates that pre-adolescent children exposed to interparental conflict generally score lower in self-regulation (Eisenberg et al., 2005), the effect of marital discord on adolescent self-regulation has not been the focus of much research (Schulz et al., 2005), although many studies have reported other negative adolescent outcomes associated with interparental conflict (Davies et al., 2002; Doyle & Markiewicz, 2005; Schwarz et al., 2012; Steinberg, Davila, & Fincham, 2006). This study anticipated that interparental conflict would have a significant association with the intercept of adolescent self-regulation. As anticipated, the analysis estimated a significant effect of interparental conflict on the intercept of self-regulation, suggesting that higher levels of interparental conflict were associated with lower adolescent self-regulation at the first time period studied. While prior studies have confirmed that interparental conflict has a negative effect on younger children's self-regulation (Cummings & Davies, 2002; Cummings &

Keller, 2006; Goeke-Morey, Cummings, Harold, & Shelton, 2003; Sturge-Apple, Davies, & Cummings, 2006), and that interparental conflict has a negative effect on adolescent problem behaviors (Buehler, et al. 1997, Siffert & Schwarz, 2011; Stone, Buehler, & Barber, 2002), no studies (other than the author's – Hansen, 2012) were found which examined the effect of interparental conflict on adolescent self-regulation. The present study confirms that the negative effect of interparental conflict on children's self-regulation continues into adolescence. Although it is likely that the adolescent experience of interparental conflict is somewhat different from that of younger children, adolescents also seem to be negatively affected by interparental conflict. Perhaps adolescents are experiencing the cumulative effect of prior years of such conflict, or perhaps current adolescent neural development is influenced by current interparental conflict.

This study anticipated that interparental conflict would have a significant association with the slope of adolescent self-regulation. A significant association between interparental conflict and the slope of adolescent self-regulation may have indicated that interparental conflict had a depressive effect on the rate of self-regulation development. No prior studies were found that explored this association. Contrary to the study hypothesis, this research did not find a significant association between interparental conflict and the slope of adolescent self-regulation, which suggests that interparental conflict does not have a significant effect on the rate of development of adolescent self-regulation. For interparental conflict to depress the intercept of self-regulation but not the slope suggests the possibility that the rate of self-regulation development is controlled by processes that are robust to interparental conflict, while at the same time the relative level of self-regulation may be influenced by such conflict. These changes might be explained if the rate of self-regulation development is itself a stable construct in adolescence, or if adolescents

generally become accustomed to their parents' levels of conflict and find ways of adjusting to it that do not affect the rate of their self-regulation development.

Clinicians may encourage parents who may be discouraged about the possibility that interparental conflict has negatively influenced their adolescents' rate of self-regulation development by reassuring them that their adolescents' *rate* of self-regulation development does not appear to be influenced by interparental conflict.

Interparental conflict and attachment to parents. This study anticipated that interparental conflict would be predictive of attachment to father and to mother. Previous studies have revealed that interparental conflict is related to lower attachment security in children's and adolescents' relationship with parents (Davies et al., 2002; Doyle & Markiewicz, 2005; Schwarz et al., 2012; Steinberg et al., 2006) but these prior studies did not examine this relationship separately for parents. This study confirmed significant correlation of interparental conflict both with adolescents' attachment to father and attachment to mother, suggesting that as interparental conflict increases, adolescents' attachment to both parents decreases.

It makes sense to conceptualize that interparental conflict has a predictive effect on an adolescents' attachment to parents (Siffert & Schwarz, 2011), as opposed to the theoretically possibility that adolescent attachment to parents predicts interparental conflict (see Doyle & Markiewicz, 2005, who came to a similar conclusion about the effects of parenting on adolescent outcomes). Clinicians may be alert to the diminishment of attachment that could result from interparental conflict observed by adolescents. Both parents and clinicians can intervene to strengthen attachments that may be damaged by such conflict.

Attachment to parents and self-regulation. This study anticipated that attachment to father and/or to mother would be predictive of adolescent self-regulation. As anticipated, this

study confirmed that more secure parental attachment is associated with higher levels of self-regulation (Beijersbergen, Bakermans-Kranenburg, IJzendoorn, & Juffer, 2008). This analysis estimated a significant effect of attachment to mother on the intercept of adolescent self-regulation, suggesting that higher mother attachment scores were associated with higher self-regulation scores at the first time self-regulation was measured. However, over time, adolescents with lower mother attachment scores increased in self-regulation while those with higher mother attachment scores decreased in self-regulation, with self-regulation scores tending to be similar at *time 6* regardless of level of mother attachment at *time 1*. It may be that the effect of mother attachment on self-regulation reaches a point of diminishing returns as the adolescent moves into young adulthood, or that mother attachment variations over time also affect adolescent self-regulation. In this study, father attachment did not appear to have a meaningful association with adolescent self-regulation, either at the first time assessed or over the duration of the study. However, using the data collected at *times 1* through *4* of the current study, Hansen (2012) found that the effect of interparental conflict on the intercept of adolescent self-regulation was mediated by attachment to father but not by attachment to mother. Father attachment accounted for 40% of the variation in the intercept of adolescent self-regulation in that study, suggesting that father attachment partially mediated the negative relationship between interparental conflict and the intercept of adolescent self-regulation (Hansen, 2012).

One difference between this study and Hansen's 2012 study is that the construct of interparental conflict was assessed in the 2012 study with ten items reflecting both *frequency* and *triangulation* in interparental conflict, and in the current study, only five items reflecting *frequency* were used to estimate the latent construct of interparental conflict. It may be that father attachment mediates the relationship between the *triangulation* aspects of interparental conflict

more than it does the *frequency* aspects of interparental conflict. This might suggest that adolescents who have been triangulated into the relationship with their parents are more likely to have weakened relationships with their fathers and to experience a depressed effect on self-regulation.

Attachment to parents as moderator of the relationship between interparental conflict and adolescent self-regulation. Because both interparental conflict and attachment to parents appeared predictive of adolescent self-regulation, and because interparental conflict appears to predict (or be predicted by) attachment to parents, it made sense to conceptualize that attachment to parents might moderate the hypothesized relationship between interparental conflict and adolescent self-regulation. It seemed plausible that the variables of attachment and conflict worked together in some way to influence an adolescent's ability to achieve self-regulation. However, in this study, neither the interaction between father attachment and interparental conflict nor the interaction between mother attachment and interparental conflict were found to be significant in predicting adolescent self-regulation. No support was found for the theory that the relationship between interparental conflict and adolescent self-regulation is moderated by attachment to father or attachment to mother. The finding that interparental conflict reduces the adolescent's attachment to both parents suggests that attachment is more likely to be influenced by interparental conflict, than to act as a moderating influence on the relationship between interparental conflict and self-regulation. This may be because the negative effect of interparental conflict on an adolescent's attachment to parents is stronger than the power of attachment to parents to overcome that effect. If attachment to parents is weakened by interparental conflict such that it cannot act as a moderator, buffer or protector of adolescent self-regulation, then clinicians may wish to help parents understand that a strong attachment

relationship with their adolescent is not a sufficient buffer against the effects of interparental conflict. That the parents have a good relationship with their adolescent may not counter the effects of interparental conflict on the adolescent's self-regulation.

Clinical implications. This study reveals that self-regulation continues to develop throughout adolescence, generally increasing each year across the five years of the study. In addition to the general recommendation given to clinicians in previous sections of the discussion, it is also important for clinicians to focus on a few specific principles derived from the findings. First, professionals working with adolescents can be encouraged that self-regulation continues to develop after childhood, likely reflecting the continuing development of the prefrontal cortex and the neural reorganization that occurs during adolescence.

This study also confirms the large body of research demonstrating the generally deleterious effect of interparental conflict on children, providing evidence that negative associations between such conflict and child self-regulation continue during adolescence. Clinicians working with families of adolescents can help parents understand the connections between the self-regulation challenges they experience with their adolescents and the conflict between themselves as parents that adolescents perceive as creating distress within the family. Perhaps some adolescent self-regulation issues can be addressed by resolving interparental conflict distress. Clinicians may also wish to help parents understand that a strong attachment relationship with their adolescent is not a sufficient buffer against the effects of interparental conflict. Parents' good relationships with their adolescents may not counter the negative effects of interparental conflict on the adolescents' self-regulation.

Limitations of this study and recommendations for further research. Important limitations of this study include the lack of analysis of how ethnic diversity may impact the study

variables of interparental conflict, attachment, and self-regulation. Do adolescents from different cultural backgrounds understand optimal interparental conflict, attachment to parents, and self-regulation differently from the culture common to the majority of the participants in this study?

This study also is limited by its lack of analysis of single-parent and gay/lesbian families, including analyzing any effects of same-sex parenting on the relationship between interparental conflict and adolescent self-regulation. Although single-parent families and families with same-sex parents were minimally represented in the set of participants, single-parent families were over-represented in the families who did not complete the entire six waves of the study, and the number of such families was not large enough from which to draw significant findings.

Consequently, data for these families were not analyzed separately. Regarding such families, the constructs of attachment and self-regulation may be different when both parents do not live in the adolescent's home (single parent situation) or when the parents are of the same sex. In situations where both parents are mothers or both parents are fathers, how does interparental conflict affect attachment, and how do these constructs affect adolescent self-regulation? Further research should also discover whether attachment to fathers suffers more from the effects of interparental conflict than does attachment to mothers and could explore whether certain parenting styles or roles are more vulnerable to the effects of interparental conflict regardless of the sex/gender of the parent.

Additional research could be done to discover whether the triangulation aspects of interparental conflict have a more deleterious effect on adolescent attachment or self-regulation than do the frequency aspects of interparental conflict. It may be that triangulation is more damaging to attachment to parents than is frequency, which may increase its negative effect on adolescent self-regulation.

Further study should also explore why adolescents who started the study at age 13 - 14 reported lower levels of self-regulation at each time period studied than those who began the study at age 12. Such consistent cohort differences across gender and site studied may suggest an influence exerted by larger political or social events during the time period 1992-1994. What kinds of larger influences might have contributed to such a broad cohort effect?

No prior study has observed differences in interparental conflict or adolescent self-regulation between residents of these two western cities. Yet the families in this study demonstrated differences in the level of interparental conflict (less conflict in the second city) and in rate of development of adolescent self-regulation (higher in the first city). Perhaps these constructs are related to one another in some way other than as set forth in the models in this study. Or perhaps some larger social, climate, or political force present in the first city creates both higher levels of interparental conflict and higher rates of adolescent self-regulation development. Further research could explore how these constructs are related or how some other variable influences these constructs in different cities.

Conclusions

The present study demonstrated that adolescent self-regulation in the studied population showed steady growth across a five-year period during adolescence, suggesting that self-regulation may continue to develop generally throughout adolescence, a finding not revealed in prior research. Interparental conflict predicted lower adolescent self-regulation scores initially, confirming prior research, but interparental conflict did not depress the rate at which adolescent self-regulation developed. As interparental conflict increased, attachment to parents decreased. No moderation effects were found for the interaction of interparental conflict and attachment to parents.

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APPENDIX A

Parental Conflict – Frequency Scale (as used by the *Flourishing Families Project*)

1. I see my parents arguing or disagreeing
2. They may not think I know it, but my parents disagree a lot.
3. My parents are mean to each other, even when I am around.
4. I see my parents arguing.
5. My parents nag and complain about each other.

The frequency scale actually used by Grych, Seid & Fincham (1992) is as follows:⁴

1. I *never* see my parents arguing or disagreeing
2. They may not think I know it, but my parents *argue or* disagree a lot.
3. My parents are *often* mean to each other even when I'm around.
4. I *often* see my parents arguing.
5. My parents *often* nag and complain about each other *around the house*.

APPENDIX B

Parent-Child Attachment Scale (Child Version) used in the *Flourishing Families Project*

1. My parent respects my feelings.
2. I rely on myself (not this parent) when I have a problem to solve.
3. My parent accepts me as I am.
4. When we discuss things, my parent considers my point of view.
5. My parent trusts my judgment.
6. I do not think I can depend on my parent.
7. I do not get much attention at home from my parent.
8. When I am angry about something, my parent tries to be understanding.

The *Inventory of Parent Attachment Scale* actually used by Armsden & Greenberg (1987) is as follows:⁵

1. **My parents respect my feelings.** (Trust Subscale)
2. I feel my parents are successful as parents. (Trust Subscale)
3. I wish I had different parents. (Trust Subscale)
4. **My parents accept me as I am.** (Trust Subscale)
5. **I have to rely on myself when I have a problem to solve.** (Alienation Subscale)
6. I like to get my parents' point of view on things I'm concerned about. (Communication Subscale)
7. I feel it's no use letting my feelings show (Communication Subscale)

⁴ Differences are italicized.

⁵ Items used in the *Flourishing Families Project* (FFP) are highlighted. These have been modified to refer to one parent rather than both parents.

8. My parents sense when I'm upset about something. (Communication Subscale)
 9. Talking over my problems with my parents makes me feel ashamed or foolish. (Alienation Subscale)
 10. My parents expect too much from me. (Alienation Subscale)
 11. I get upset easily at home. (Alienation Subscale)
 12. I get upset a lot more than my parents know about. (Alienation Subscale)
 13. **When we discuss things, my parents consider my point of view.** (Trust Subscale)
 14. **My parents trust my judgment.** (Trust Subscale)
 15. My parents have their own problems, so I don't bother them with mine. (Alienation Subscale)
 16. My parents help me to understand myself better. (Communication Subscale)
 17. I tell my parents about my problems and troubles. (Communication Subscale)
 18. I feel angry with my parents. (Alienation Subscale)
 19. **I don't get much attention at home.** (Alienation Subscale)
 20. My parents encourage me to talk about my difficulties. (Communication Subscale)
 21. My parents understand me. (Trust Subscale)
 22. **I don't know whom I can depend on these days.** (Alienation Subscale)
 23. **When I am angry about something, my parents try to be understanding.** (Trust Subscale).
 24. I trust my parents. (Trust Subscale)
 25. My parents don't understand what I'm going through these days. (Alienation Subscale)
 26. I can count on my parents when I need to get something off my chest. (Communication Subscale)
 27. I feel that no one understands me. (Alienation Subscale)
 28. If my parents know something is bothering me, they ask me about it. (Communication Subscale)
-

APPENDIX C

Child Self-Regulation Scale (Child Version) used in the *Flourishing Families Project*.

1. I have a hard time controlling my temper.
2. I get so frustrated I feel ready to explode.
3. I get upset easily.
4. I am afraid I will lose control over my feelings.
5. I slam doors when I am mad.
6. I develop a plan for all my important goals.
7. I think about the future consequences of my actions.
8. Once I have a goal, I make a plan to reach it.
9. I get distracted by little things.
10. As soon as I see that things are not working, I do something about it.
11. I get fidgety after a few minutes if I am supposed to sit still.
12. I have a hard time sitting still during important tasks.
13. I find that I bounce my legs or fiddle with objects.