

THESIS

HOSTILE CAUSAL ATTRIBUTIONS AND HARSH PARENTING:
PARENT AGE AS A MODERATING FACTOR

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ABSTRACT

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Adolescent mothers tend to be more at risk for harsh parenting than older mothers. Parent processes such as stress, hostile causal attributions, and anger are also linked to harsh parenting. In this study, adolescent mothers, former adolescent mothers, and older mothers (N=589) were compared and the links between hostile causal attributions and stress and harsh parenting were examined. Age of the mother was looked at as a moderator in these relations. Mediation pathways between stress, anger, and harsh parenting and hostile causal attributions, anger, and harsh parenting were also examined. Results indicate that adolescent mothers are more alike than different from older mothers. In all groups, stress and hostile causal attributions were predictive of harsh parenting, and correlational analyses indicated that anger mediated these pathways. However, when baseline preference for harsh punishment was taken into account, anger no longer mediated any of the pathways. This indicates that baseline preference for harsh punishment may be the most significant predictor of late punishment. The only pathway moderated by age was between parent-blaming attributions and harsh parenting in that older mothers were more likely to parent harshly in the presence of parent-blaming attributions than younger mothers. These findings have implications for prevention and intervention programs and may shift focus from age of the parent to the parenting processes of stress, hostile causal attributions, and anger management.

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Introduction

Adolescents who become mothers are at greater risk for harsh parenting (Lee, 2009; Lee & Guterman, 2010). For example, adolescent parents tend to have low emotional availability and a higher level of negative interactions with their infants than older parents (Aiello & Lancaster, 2007; Crugnola, Ierardi, Gazotti, & Albizzati, 2014; Nicolson, Judd, Thomson-Salo, Mitchell, 2013). In a study comparing adolescent mothers and adult mothers, Lee (2009) found that adolescents are more likely to show psychological and physical aggression towards their children and are more likely to endorse spanking. More worrisome, harsh parenting is a risk factor for child abuse (Lee, 2009), and children of adolescents are twice as likely to be abused (Stevens-Simons, Nelligan, & Kelly, 2001). Based upon these findings, it is apparent that adolescent mothers' rearing practices differ from adult mothers in significant ways.

These differences may in part be explained by fundamental dissimilarities between adult mothers and adolescent mothers. Adolescent mothers tend to have less education, lower income, and higher financial stress than adult mothers (Easterbrooks, Chaudhuri, Bartlett, & Copeman, 2011; Lee, 2009; Mendes, 2009). These factors contribute to higher stress levels and subsequently may lead to harsher parenting (Pereira, Negrão, Soares, & Mesman, 2015). There is also evidence that adolescent mothers' social cognitions and interactions are not as developed as adults', which may help explain the differences in rearing practices (Aiello & Lancaster, 2007; Azar, Okado, Stevinson, & Robinson, 2013; Crugnola et al., 2014; Nicolson et al., 2013; Smith, 2001). The current study examines one specific type of social cognition, causal attributions, as they relate to anger and child-rearing practices. This study also examines the possible link between stress, anger, and harsh parenting.

Parental causal attributions have consistently been linked to parenting behavior. Parent-related attributions (self-blaming) and child-related attributions (child-blaming) are both associated with harsh and overreactive parenting (Ateah & Durrant, 2005; Bugental, Blue, & Cruzcosa, 1989; Bugental & Happaney, 2000; 2002; 2004; Haskett, Scott, Grant, Ward, & Robinson, 2003; Nix, Penderhughes, Dodge, Bates, Pettit, & McFadyen-Ketchum, 1999; Pidgeon & Sanders, 2012; Rodriguez & Tucker, 2014; Skowron, Kozlowski, & Pincus, 2010; Sturge-Apple, Suor, & Skibo, 2014; Wang, Deater-Deckard, & Bel, 2013). Some attribution studies have used adolescent populations and found that child-blaming attributions lead to more coercive parenting and that adolescents who have less knowledge of child development are more likely to make hostile attributions and demonstrate harsh parenting (Smith, 2002; Strassberg & Treboux, 2000). Although hostile attributions have consistently been associated with harsh parenting in both adolescent and adult samples, the role of differences in age or maturity in making and acting upon attributions has not been studied directly. In the current study, age was treated as a moderating factor and anger as a mediator of the relation between both attributions and stress and harsh rearing practices. The research question examined in the current study is whether attribution styles and stress levels in adolescent mothers as compared to adult mothers account for differences in harsh parenting.

Maturity, Emotion Regulation, Stress, and Rearing Practices

One of the major determinants of parenting relates to an individual's personal characteristics, including age and maturity (Belsky, 1984). Adolescents typically are less mature, emotionally and cognitively, than are adults (Aiello & Lancaster, 2007; Crugnola et al., 2014), which may contribute to their higher rate of child maltreatment. Some have pointed out that adolescents are not developmentally ready to raise children (Aiello & Lancaster, 2007).

Separation-ideation is a developmental task important in adolescence that involves the development of an autonomous sense of self and separation from parental attachment figures, and may be one indication that adolescents are not ready to parent (Aiello & Lancaster, 2007). Aiello and Lancaster (2007) looked at adolescents' separation-individuation and the effect of their psychological immaturity on their children in a longitudinal study starting in pregnancy and ending two years later. The researchers found that the mothers' developmental immaturity has detrimental effects on children's cognitive development and children's own separation-individuation. In an intervention study, adolescents were provided education about infant development and interactions (Nicolson et al., 2013). This significantly increased their emotional availability and healthy attachments, demonstrating that some of these effects may be due to adolescents having less knowledge of child development (Nicolson et al., 2013)

Another way in which adolescents may not be as developmentally ready to rear children is their lower level of emotion regulation (Crugnola et al., 2014). As Orón Semper (2014) noted, emotion regulation is a key component in adolescents' successful maturation. In a recent review of the literature on maternal emotion and cognitive control, Crandall et al (2015) found that mothers with lower emotional control are at risk for child maltreatment, negative parenting, and less positive parenting (see also Lansford et al., 2014; Mazursky-Horowitz et al., 2014). In a study looking at adult ADHD symptoms and parenting skills, emotion regulation was found to mediate the relation between ADHD symptoms and harsh parenting and lead directly to harsh parenting (Mazursky-Horowitz et al., 2014). Lower maternal emotion regulation is also associated with higher levels of infant negativity (Bridgett, Burt, Laake, & Oddi, 2013). In addition, there may be a rather complex relation between emotion regulation, parenting style, socioeconomic status (SES), and resulting parenting behaviors.

Part of this relation is shown by the correlations between low emotional control and parenting risks that are strongest in families under stress (Chaudhuri, Easterbrooks, & Davis, 2009; Crandall, 2015). The relationship between stress and harsh parenting practices will be explored in the next section. Prominent risks among adolescent parents that factor into parental stress include low maternal education, low income, household chaos, and single-parent families (Barajas-Gonzalez & Brooks-Dunn, 2014; Easterbrooks et al., 2011; Lee, 2009). Mothers in lower SES brackets tend to show lower emotion regulation (Martini, Root, & Jenkins, 2009), and low maternal emotion regulation contributes to the level of chaos in the household (Bridgett et al., 2013). Chaos may be harmful to parenting practices because it moderates the association between hostile attributions and parenting, such that greater chaos makes harsh parenting more likely in the presence of hostile attributions (Wang et al., 2013). Even when controlling for socioeconomic factors, parents with low emotion regulation demonstrate higher risk for child abuse (Skowron et al., 2010). This suggests that parents' anger proneness in response to child misbehavior may be an important mediator of both stress and causal attributions (Dix, Reinhold, & Zambarano, 1990).

Adolescent's combination of immaturity and lower emotional control may put them at risk for displaying greater anger towards their children (Crandall, 2015; Crugnola et al., 2001). Anger levels are associated with higher levels of hostile attributions and harsh parenting (Pidgeon & Sanders, 2014), and will be expounded on in later sections. Not only do adolescent mothers generally have the added stress of low SES and possibly living in more chaotic households, but they also tend towards lower emotion regulation (Crugnola et al., 2001), which could cause them to be more anger prone in reaction to children's misbehavior. Therefore, this

combination of risk factors increases the probability that adolescent mothers will make hostile attributions and act upon these in ways that could potentially harm their children.

Stress and Rearing Practices

Family stress theory states that economic hardship can lead to heightened financial stress and overall stress in the family (Smith & Hamon, 2012) and can disrupt positive parenting (Neppl, Senia, & Donnellan, 2016). The link between stress and negative parenting practices and negative child outcomes is well documented (e.g., East, Chien, & Barber, 2012; Haapsamo, Pollock-Wurman, Kuusick-Gauffin, Ebeling, Larinen, Soini, & Moilanen, 2013; Murphy, Marelich, Armistead, Herbeck, & Payne, 2010; Pereira et al, 2015). As stated previously, some of the contributors to stress in parents are low income, low education, and neighborhood factors (Barajas-Gonzalez & Brooks-Dunn, 2014). Higher levels of stress are related to harsh discipline (East et al., 2012; Pereira et al., 2015; Ricketts & Anderson, 2008), child abuse and neglect (Maguire-Jack & Negash, 2016), psychological aggression (Park, Ostler, & Fertig, 2015), and fewer positive parenting skills (e.g., Mills-Koonce et al., 2009; Murphy et al., 2010). Parents with higher stress have lower engagement with their children (Murphy et al., 2010; Ritchie & Holden, 1998), higher negative-intrusive behavior (Mills-Koonce et al., 2009), and lower proactiveness (giving instructions before misbehavior occurs) and more use of prohibition (Ritchie & Holden, 1998)

The way that parents interact with their children while stressed affects child outcomes (Neppl et al., 2016). When parents experienced higher stress, they had infants with lower levels of competence and persistence in social interactions (Sparks, Hunter, Backman, Morgan, & Ross, 2012). Maternal stress is also associated with heightened child externalizing behavior (Baker, Heller, & Henker, 2000), including aggressive and delinquent behavior, and internalizing

symptoms such as depression (Haapsamo et al., 2013; Murphy et al., 2010). In sum, stress is related to many negative parenting behaviors, which research consistently links to negative child outcomes.

Stress relates to parental attributions and anger as well. Stress has been found to positively correlate with child blame (Esdaile & Greenwood, 1995) and parent-centered or self-denigrating attributions (Martorell & Bugental, 2006). Martorell and Bugental (2006) found that stress acted as a mediator between parent-centered attributions of powerlessness and harsh punishment in that parents who had higher stress reactivity were more likely to parent harshly as a result of their attributions.

Parents with higher stress levels tend to be more prone to greater anger expression (Lam, 1999; Lutenbacher, 2002). When compared to nonabusive parents, abusive parents reported higher stress, more anger, and endorsed harsher forms of punishment (Graham, Weiner, Cobb, & Henderson, 2001). Therefore, an association between stress, anger, and attributions may affect parental behaviors and will be further examined in this study.

Parent Attributions and Rearing Practices

When faced with a crying baby or a disobedient 2 year old, parents must assess what is happening with their child and respond accordingly. How parents assess children's behavior affects how they respond. The social information processing (SIP) model posits that situations such as these may activate schemas related to what *should* happen, leading to negative causal attributions, which in turn lead to response generation and possible aggression (Azar et al., 2013; Fontaine, Yang, Dodge, Pettit, & Bates, 2009). Thus, cognitive mechanisms, such as causal attributions, likely mediate the relation between environmental stimuli and parents' reactions (Azar et al., 2013). Attributions are beliefs formed when people assess others' behavior based on

causal inferences (Dix, Ruble, Grusec, & Nixon, 1986). They have been conceptualized in various ways. Social cognitive learning theory looks at attributions as learned beliefs based on experiences and interactions, whereas others view attributions as knowledge structures that are memory-based cognitions (Bugental & Happaney, 2002). Regardless of how they are formed, attributions significantly affect human interaction. In the parenting literature, two types of attributions are typically studied: parent-centered and child-centered.

Parent-centered attributions are typically described as cognitions in which parents blame themselves for negative caregiving outcomes. These attributions are usually measured as perceptions of low power in the caregiving relationship. Parents with perceptions of low power tend to attribute high importance to factors outside of their control (Bugental, 1987). This relates to an external locus of control in which parents believe that external factors carry more import than internal ones. Therefore, they do not believe that they hold high power over outcomes with their children. Adolescents who become pregnant tend to have a higher external attribution of control orientation (McIntyre, Saudargas, & Howard, 1991), so they may also demonstrate higher prevalence of perceptions of low power in the parenting relationship.

Parent-centered, self-blaming attributions are associated with both harsh parenting (Bugental & Happaney, 2000; 2002; 2004; Bugental et al., 1989; Bradley & Peters, 1991; Skowron et al., 2010) and lax parenting (Leung & Slep, 2006). Mothers with low perceived power tend to use more negative affect with difficult children and to become more annoyed when interacting with their children (Bugental, 1987; Bugental, Blue, & Lewis, 1990). This type of attribution can be present prenatally as a consequence of a harsh or abusive rearing history (Bugental & Happaney, 2004). Therefore, these attributions may be an attribute of the parent rather than being stimulated by the child's behavior as is sometimes proposed with other types of

attributions (Wilson, Gardner, Burton, & Leung, 2006). Other evidence shows that a mother's perception of power interacts with the temperament of her child so that when a mother with a perception of low power interacts with a difficult child she is likely to respond with anger and punishment. (Martorell & Bugental, 2006). Bernstein et al. (2013) studied parent-centered attributions over the transition to parenthood and found that the overall perception of parental control over caregiving failures remained stable over time, but that some subcomponents of this attributional bias did change. More specifically, over time mothers tended to focus less on the internal qualities of both mother and child and more on external factors (Bernstein, Laurent, Measelle, Hailey, & Ablow, 2013). This shows that although mothers' general low power attribution bias may remain stable, they may learn over time that situational factors play a large role and not every instance of caregiving failure is due to internal factors of either mother or child.

When asked to provide an explanation for a child's behavior, mothers are more likely to provide a child-centered attribution than a parent-centered one (Smith & O'Leary, 1995). Child-centered attributions are typically considered on the dimensions of internal factors, or intentionality, and external factors, or situational (Dix et al., 1986). Hostile, child-centered attributions are those that link children's negative behavior to internal factors and intentionality. An association between hostile child-centered attributions and harsh parenting and child maltreatment is well supported (Ateah & Durrant, 2005; Nix et al., 1999; Pidgeon & Sanders, 2012; Rodriguez & Tucker, 2014; Sturge-Apple et al., 2014; Wang et al., 2013). In Smith and O'Leary's (1995) foundational study, mothers with "dysfunctional" child-centered attributions were more likely to be emotionally aroused and use overreactive and harsh parenting. Similarly, in an experimental study by Slep and O'Leary (1998), mothers were randomly assigned to either

a child-responsible condition or child-not-responsible condition. In the child-responsible condition, mothers were given possible explanations for their child's misbehavior that were rooted in intentionality (child-centered hostile attributions). Mothers in this condition demonstrated significantly harsher discipline in ensuing mother-child interactions (Slep & O'Leary, 1998).

Hostile attributions cannot only lead to harsh discipline, but are also a risk factor for abuse (Rodriguez & Tucker, 2014). In comparisons to a nonclinical comparison group, parents who were at high risk for abuse were more likely to attribute children's positive behavior to external factors and children's negative behavior to internal factors (Dadds, Mullins, McAllister, & Atkinson, 2003). Hostile child-centered attributions may lead to harsher parenting by contributing to parental distress (Gavita, David, & DiGiuseppe, 2014). In turn, parents who are distressed are at much greater risk for child abuse (Rodriguez & Tucker, 2014). Parents tend to use these attributions more as children develop, in large part because they believe that an older child knows the parents' rules and expectations, and intentionally violates them (Dix et al., 1986; Dix, Ruble, Zambarano, 1989). In particular, parents attributed more of their child's misbehavior to personality and intentionality as the child aged from 4 to 13 years (Dix et al., 1986). However, Cote and Azar (1997) found that child-blaming attributions actually decreased as the child aged. Their youngest group was in fifth grade (around age 10) and their oldest group was in eleventh grade (around 16-17 years old). Thus, it appears that child-blaming attributions may peak in late childhood and early adolescence and then decrease as the children develop more fully (Cote & Azar, 1997). Child-blaming attributions may increase over time because as the child develops and grows, it is natural for a parent to assume that children can control their behavior and may intend more harm than at younger ages (Dix et al., 1989). They could then lower as the child

becomes an adolescent because parents may believe that their child is more influenced by school, teachers, and peers rather than acting according to their disposition and intentionality (Cote & Azar, 1997).

Anger and Attributions

One possible explanation for the association between hostile attributions and harsh parenting is the level of anger experienced by the parent. In a study with nonparents, high trait-anger individuals were more likely to blame others and see them as an antagonist (Hazbroek, Howells, & Day, 2001), indicating that anger could be associated with a tendency towards child-blaming attributions. In parents, mothers who are in an angry mood are more likely to believe that the child's behavior is intentional (Dix et al., 1990). In turn, mothers who attribute a child's misbehavior to intentionality, and who become angry in response, are more likely to use significantly harsher punishment (Ateah & Durrant, 2005; Graham et al., 2001; Slep & O'Leary, 1998). Graham et al. (2001) found that abusive mothers were more likely than nonabusive mothers to blame the child for negative behavior, report more anger, and endorse harsher punishment. Similarly, in a comparison of clinically angry parents to nonclinical parents, negative child-centered attributions correlated with anger intensification, leading to higher risk of child maltreatment (Pidgeon & Sanders, 2012). Parents were included in the clinically angry group if they had been reported for potential child abuse or neglect, and/or indicated concern over their anger issues and had elevated scores on an anger measure. Clinically angry parents are more likely to attribute negative child behavior to stable personality characteristics of the child and therefore interpret them as more intentional and blameworthy (Pidgeon & Sanders, 2012). They are also more likely to make negative attributions about their parenting behavior,

attributing it to internal causes (Pidgeon & Sanders, 2012). This shows a duality of negative attributions, such that parents blame both the child and themselves for negative parenting.

Based upon these findings, there may be varying ways in which anger is related to attributions and parenting. In particular, mothers may make hostile attributions because they are in an angry mood (Dix et al., 1990), or because they are temperamentally predisposed to anger and hyperreactivity (Bradley & Peters, 1991; Pidgeon & Sanders, 2012). Alternatively, they may become angry because of how they interpret children's behavior (Ateah & Durrant, 2005; Slep & O'Leary, 1998). There have also been some discrepancies in the literature, with some studies failing to find significant relations between trait anger and child-blaming attributions (Leung & Slep, 2006). In Leung and Slep's study, path analyses did not find a significant association, but a hierarchical regression showed that anger did account for a significant amount of the variance in child-blaming attributions. They hypothesized that this discrepancy could be due to the nature of the relationship between anger and attributions. Perhaps child-blaming attributions are more likely to be affected by anger in the moment than by how angry parents feel most of the time (Leung & Slep, 2006). Because of inconsistencies in outcomes, further research is needed to establish the relationship and direction between trait anger, hostile child-centered attributions, and harsh and maladaptive parenting.

The Current Study

Adolescent parents face many risk factors in parenting, one of which may be the attributions that they make about their own power and their child's behavior. Prior research has shown that hostile attributions are linked to harsh and lax parenting in both adult and adolescent samples, but direct comparisons between the groups are lacking. Based upon current research, I hypothesized that adolescents are more likely to make hostile attributions about child

misbehavior than are adults and also are more likely to report the use of harsh punishment with their young children (see Figure 1). Second, parental age was hypothesized to moderate the association between causal attributions and harsh parenting such that in the presence of hostile attributions, adolescent mothers are more likely to demonstrate harsh parenting practices than adults (see Figure 2). Third, the role of anger as a possible mediating factor in the relationship between hostile attributions and harsh parenting and between stress and harsh parenting is examined. I hypothesized that anger mediates the relation such that when hostile attributions or stress are present, and anger is heightened, predisposing mothers to harsh rearing practices (see Figure 3a and 3b).

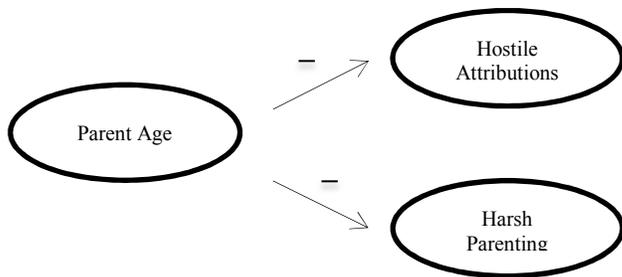


Figure 1. Hypothesized model in which increased parent age leads to lower hostile attributions and therefore lower levels of harsh parenting

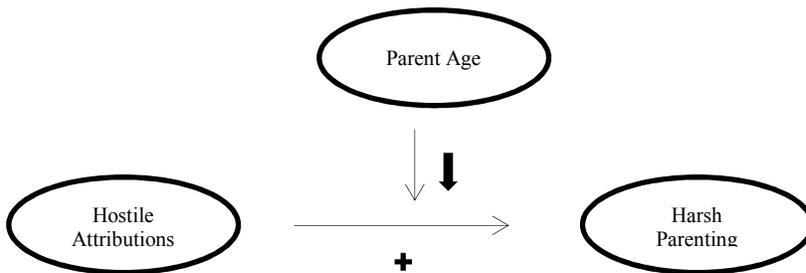


Figure 2. Hypothesized model in which parent age moderates the relation between hostile attributions and harsh parenting

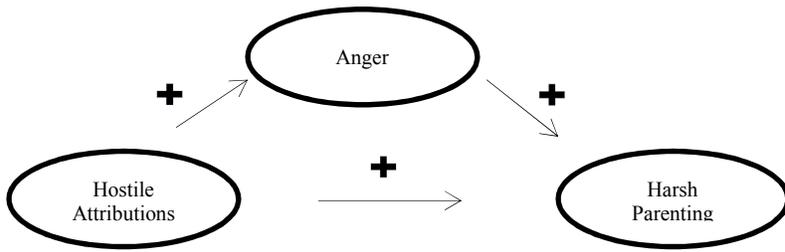


Figure 3a. Hypothesized model in which anger mediates the relation between hostile attributions and harsh parenting

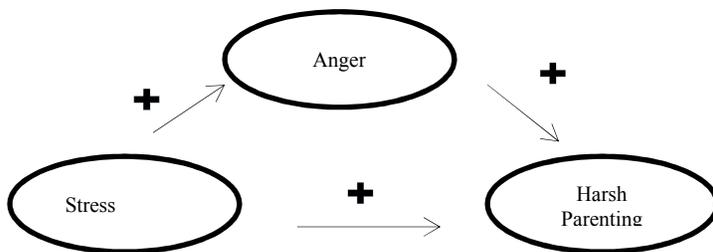


Figure 3b. Hypothesized model in which anger mediates the relation between stress and harsh parenting.

Method

Research Design

The current study uses a longitudinal comparison and associational design. Data were collected at three points. This design allows for valid testing of moderation and mediation (Maxwell & Cole, 2007). Groups were divided according to age at birth of first child as well as current age, making parent age the primary predictor variable. The association between hostile attributions and harsh parenting was assessed, and group differences were analyzed, in terms of mean differences on each variable as well as moderation of the association between attributions and harsh parenting.

Participants

The participants were selected from several databases in order to make comparisons by age of parent. Participants were subdivided into three groups: 116 adolescent mothers, 161 former adolescent mothers who gave birth prior to age 20 but at present were older than 20, and 312 older mothers who gave birth after age 20. The three groups were included to determine if age at first birth or maturity at present time account for differences in parenting. In order to detect a small effect size in ANCOVA ($d = .20$), a sample of 589 provides statistical power of 1.00. In order to detect a small effect size ($R^2 = .15$) in a linear multiple regression with 10 predictors, including covariates and interaction terms, a sample of 589 provides power of 1.00. The current sample therefore provides sufficient power to detect significant differences and associations using these tests, even for small effect sizes.

Adolescent mothers from three sites in the Rocky Mountain region were included in the teen mothers group. Participants were referred through Temporary Assistance for Needy Family

(TANF) administrators, school systems, health and addiction agencies, teen life centers, and other community agencies. All participants were eligible for TANF, indicating that they are of low socioeconomic status. The participants were all below the age of 20 at the start of the study and the average age at the birth of their first child was 16.36.

The former teen mothers and older mothers were selected from several other data sets that involved evaluations of the DARE to be You program (DTBY; Miller-Heyl, MacPhee, & Fritz, 1998). Participants were recruited in several different counties in the Rocky Mountain region and were ethnically diverse and primarily low income. They were recruited through Head Start centers, schools, and other community agencies that serve low-income families. One criterion for selection of participants in the two comparison groups is that the first-born child could be no older than 4 years of age, given that this was the oldest child's age in the group of adolescent mothers.

Preliminary analyses of group differences in demographics were conducted in order to establish if the three groups were similar at baseline. As is evident in Table 1, there are large group differences on several of the demographic variables, all of which are consistent with demographic profiles of adolescent mothers (Easterbrooks et al., 2011). Given this, welfare receipt, marital status, and ethnicity (reference group = White) were included as covariates in between-group analyses due to baseline differences. Child's age also was treated as a covariate given that child age was correlated with use of punishment and, consistent with research by Dix et al. (1986), changes in both parent-centered attributions, $F(1,252) = 7.71, p = .006$, and child-blaming attributions, $F(1,252) = 4.33, p = .01$, increased as a function of child age.

Table 1
Mean (SD) Sample Demographics, by Group

Variable	Group			Difference
	Adolescent	Former	Older	
Age at First Birth	16.36 (1.12)	17.68 (1.09)	24.61 (4.51)	$F(2,586) = 366.08^{***}$
Age of Child	1.28 (.80)	3.04 (.67)	2.99 (.69)	$F(2,586) = 276.20^{***}$
Education (years)	10.40 (1.33)	11.81 (1.53)	12.98 (1.93)	$F(2,586) = 100.18^{***}$
Ethnicity (%)				$\chi^2 = 62.60^{***}$
African American	12.9	.6	1.3	
European American	34.5	23.0	42.4	
Hispanic	18.1	29.2	16.2	
American Indian	34.5	45.6	39.5	
Marital Status (%)				$\chi^2 = 106.44^{***}$
Single	61.2	38.5	36.8	
Married/Partnered	38.8	62.0	62.8	
Welfare Receipt (% yes)	36.2	58.4	39.4	$\chi^2 = 19.47^{***}$
Employed (% yes)	29.3	41.6	55.4	$\chi^2 = 25.36^{***}$

*** $p < .001$.

Procedure

Adolescent participants completed baseline, 6-month, and 1-year follow-ups. Surveys were given in a group setting by a trained data collector. The researcher orally administered the paper-and-pencil surveys, using an administration manual as a guide. The follow-up data collection was conducted in the same manner. Older comparison participants also completed paper-and-pencil surveys in a group setting, administered by a trained data collector. They completed the battery of measures at baseline, 6 months, and 1 year later. Participants received monetary compensation for their time. All procedures for ethical conduct in research were followed and approved by the Colorado State University Institutional Review Board.

Measures

Parent attributions. Causal attributions were measured with four vignettes depicting different types of behavior that may be problematic for parents. Two vignettes concerned violations of moral standards or household rules and the other two were related to oppositional

behavior. Parents were asked to imagine themselves and their child in each situation, and then rate four types of causal attributions as explanations for their difficulty in coping with the child's behavior: lack of ability ("I'm not good at handling this;" $\alpha = .79$), task difficulty ("This is a hard situation to handle;" $\alpha = .77$), insufficient effort ("I haven't tried hard enough;" $\alpha = .81$), and child blame ("She did this knowing it would upset me;" $\alpha = .83$). The first three types of attribution relate to parent-centered attributions. Each attribution was rated on a scale from 1 (*Strongly disagree*) to 5 (*Strongly agree*). This measure is a simplified version of Sigiano and Lachman's (1985) personal control scale. Internal reliabilities were adequate in the DTBY sample (.76 to .84) but its validity has been more difficult to establish. Although it had convergent and construct validity, with measures of self-esteem and harsh punishment, the measure lacks discriminant validity because attributions that should not be related to other variables in fact were. Some participants agreed with all explanations for failure; these parents also were less confident in their parenting skills and had an external locus of control. Anecdotal evidence indicates that the participants had difficulties with the response format, and found it challenging to reflect on their own thought processes and likely responses to hypothetical situations.

Parent anger. Anger was measured as part of the vignettes described above. One question per vignette asked parents to predict how angry they would become in response to child's behavior (e.g., "My child's behavior would make me mad") and responses range from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). The Cronbach's alpha for this scale is .85.

Child-rearing practices. Participants in all three groups completed the short form of the Parent-Child Relationship Inventory (PCRI). The PCRI short form (PCRI; Gerard, 1994) includes a Limit Setting scale (9 items) that assesses consistent control vs. coercion. This scale

contains a mixture of items on problematic child behavior (e.g., “My child is out of control much of the time;” “My child really knows how to make me mad”), parent anger (e.g., “I often lose my temper with my child”), and control (e.g., “I wish I could set firmer limits with my child”).

Higher scores represent more positive attributes such as consistent, democratic control. The PCRI is uncorrelated with social desirability, is sensitive to the effects of parent education, and correlates with other measures of child-rearing practices (Gerard, 1994). Alpha (.79-.89) and test-retest reliability (.76-.92) were high in both the DTBY samples and the adolescent sample.

Mothers in the adolescent group also completed a 10-item measure of coercion and parent-child conflict from the Behavior Checklist for Infants and Children ($\alpha = .77$). The items, which are rated from 1 (*Strongly disagree*) to 4 (*Strongly agree*), focus on the child’s oppositional behavior (e.g., “My child has a ‘short fuse;’ she/he easily becomes angry or upset”) and the parent’s punitive rearing practices (e.g., “I need to come down hard on my child when he/she acts up.”). This measure is positively correlated with parents’ use of harsh punishment (Walker & MacPhee, 2011).

Mothers in the former and older groups completed a questionnaire asking how often they implemented certain parenting strategies, reported from 1 (*Never*) to 4 (*Often*). Each strategy included concrete examples to ensure uniformity. Based on factor analysis, strategies such as spanking and criticizing were combined into harsh punishment with an alpha reliability of .81 and retest coefficient of .61.

In order to make comparisons between groups, composite z scores were created that include the Harsh Punishment checklist measure, the coercion/conflict measure, and the Limit Setting measure (reverse scored) from the PCRI. The scores in the samples that used all three

measures were highly intercorrelated, $r = .51$ to $.71$, which justifies creating a standardized score based on whatever measures were available.

Parental stress. A 9-item subscale on the PCRI measures stress management in the parenting role. High scores indicate that the mother is overburdened with child-rearing responsibilities and financial struggles. Scores on this scale were averaged over the three time points to indicate mothers' average stress level. The Cronbach's alphas were $.71$ in the DTBY sample and $.81$ in the adolescent sample.

Preliminary Analyses

First, Cronbach's alphas were computed by group and determined to be adequate ($\alpha > .74$) on all of the measures in each group.

In order to determine if parent responses to the attribution vignettes can be reduced to a smaller number of dimensions or latent factors, I computed an exploratory factor analysis with principal axis extraction and varimax rotation. The first three questions on each of the vignettes loaded on the first factor, indicating that they address parent-centered attributions, and the fourth question on the vignettes loaded on a separate factor related to child-blaming attributions. Because of this, I computed a composite score for the first three responses in each vignette ($\alpha = .88$).

Participants were drawn from intervention trials so intervention and control participants' changes over time were examined to see if there were differential changes. Significant group by treatment effects were observed on the measures of stress ($p = .036$) and punishment ($p = .004$), so treatment group was a covariate in the analyses. In order to account for possible biased attrition, I created a dichotomous variable to indicate whether the Time 3 data were missing or not and then examined 10 baseline outcome variables (e.g., measures of attributions, rearing, and

stress) and 9 demographic variables to see if any predicted differential attrition. The only variable that was predictive was mother's education ($M = 11.79$ for those who dropped out versus $M = 12.26$ for those who did not drop out). Therefore, mother's education was included as a covariate in the analyses in addition to welfare receipt, marital status, and ethnicity.

In the within-group analyses, several demographic variables were tested as possible covariates. In the adolescent mother group, child's age was found to be negatively correlated with hostile child-centered attributions, $r(114) = -.19, p < .05$. In the former adolescent mother group, no demographic variables were significant correlates of processes in the model but in the older mother group, mother's education was positively correlated with anger, $r(310) = .26, p < .01$. Given this, child's age and mother's education were included in the within-group analyses that were conducted.

Next, I imputed missing data for participants who did not complete the 6-month and one-year follow-ups using a multiple imputation strategy recommended by Schafer and Graham (2007). The fully conditional Markov chain Monte Carlo (MCMC) method was used to impute missing data for normally distributed dependent variables. It uses an iterative approach to compute a single missing variable using all other variables in the model as predictors. The method continues for each variable in the model to the number of iterations specified, which was 20 in the current study. Data for at least one variable in the model were missing for 197 participants, primarily on the measure of anger.

Results

Group Differences in Attributions, Anger, and Harsh Punishment

Adolescent mothers were hypothesized to be more predisposed to make hostile attributions about child behavior and, consequently, to report higher levels of anger and punishment in response to child misdeeds. One-way ANCOVAs were used to test baseline group differences in attributions, anger, stress, and harsh punishment; covariates included child's age, mother's education, marital status, and ethnicity. There were no significant differences at baseline between groups in stress, parent-centered attributions, child-centered attributions, or anger. However, contrary to the hypothesis, older mothers were significantly more likely to use punitive rearing practices than the other two groups (see Table 2), even with child age covaried.

Table 2

Mean (SD) Parent Attributions, Anger, Stress, and Punishment at Baseline, by Group

Variable	Group			Difference
	Adolescent	Former	Older	
Parent-centered attributions	2.30 (.83)	2.41 (.78)	2.43 (.79)	$F(2,583) = 1.33$
Child-blaming attributions	2.68 (1.08)	2.76 (.96)	2.56 (1.06)	$F(2,579) = 2.00$
Parent anger	2.98 (1.19)	3.19 (.94)	3.03 (.99)	$F(2,389) = 1.20$
Stress	2.39 (.47)	2.39 (.47)	2.43 (.46)	$F(2,571) = .40$
Punishment (z score)	-.39 (.91)	.02 (.80)	.12 (.80)	$F(2,586) = 7.91^*$

Note. Marginal group means are presented, corrected for covariates.

* $p < .05$.

Does Parent Age Moderate Correlations among Attributions, Anger, and Harsh

Punishment?

The second hypothesis was that parent age moderates the association between attributions and stress, anger, and harsh punishment such that the correlations are stronger among adolescent mothers. This hypothesis was tested by computing within-time and across-time correlations

among stress, anger, attributions, and punitive punishment for adolescent mothers, former adolescent mothers, and older mothers separately. These correlation matrices also provide initial information about anger as a mediator between attributions and harsh punishment.

Within-time correlations. In all three groups, overall stress was positively correlated with anger at Time 1 and at Time 2, and with harsh punishment at Time 1 and Time 3 (see Tables 3-5). Stress was not correlated with any of the adolescent mothers' or former adolescent mothers' attributions, but was positively correlated with both types of attributions in the older mothers group. The correlations between stress and attributions are all small, the correlations between stress and anger are medium to large, and effect sizes for stress and harsh punishment are large. None of the correlations involving stress and attributions, anger, or harsh punishment differed significantly by group, $z < 1.37$, $p > .17$, indicating that moderation is not supported for these variables.

Parent attributions were positively correlated with anger in all three groups. The correlation between parent attributions and anger at Time 1 were largest for the older mothers ($r = .51$, $p < .01$). Child attributions were positively correlated with anger at both time points in all groups, with large effect sizes. Of all the possible group comparisons of attribution-anger correlations, only one was statistically significant: The correlation of child-blaming attributions at Time 1 with anger at Time 2 was greater among older mothers than among adolescent mothers, $z = 2.24$, $p = .025$, although one difference would be expected by chance alone. Thus, moderation by group is not supported for these associations either.

Correlations between attributions and harsh punishment have mixed results between the groups (see Table 3-5). In the adolescent mothers, neither type of attribution at Time 1 was correlated with harsh punishment at Time 1, but both types of attribution were predictive of harsh

punishment at Time 3 (Table 3). This may be due to the children entering toddlerhood. The former adolescent mothers differed in this in that the only significant correlation between attributions and concurrent punishment was at Time 1 between both parent and child attributions and harsh punishment, with attributions not predicting harsh punishment at Time 3. The older mothers demonstrated small but significant, positive correlations between both types of attribution and punishment at Time 1 and between child attributions at Time 1 and punishment at Time 3. However, the group differences in correlations between attributions and later punishment were not significant, with the relation between parent-centered attributions and punishment exhibiting a trend, $z = 1.42, p = .08$. Anger was concurrently, positively correlated with harsh punishment in all three groups with effect sizes ranging from medium to large.

In summary, the pattern of correlations among variables in the model, measured concurrently, was similar across groups with the exceptions of stress being correlated with attributions only in the older mother group, and some variations between groups in how attributions correlate with concurrent and later harsh punishment. It is important to note, however, that the only group where parent-blaming attributions correlated with Time 3 punishment was the adolescent mother group.

Cross-time correlations. In order to test mediation, temporal precedence is important and can be supported initially by cross-time correlations. When examining correlations as evidence for mediation, the predictor must be associated with the outcome, the predictor with the mediator, and the mediator with the outcome (Baron & Kenny, 1986). In the hypothesized model, anger is considered the mediator of both child and parent attributions in relation to punitive parenting. Anger also was examined as a mediator of stress and punitive parenting. Results are reported separately by group.

Table 3
Correlations among Predictors for Harsh Punishment among Adolescent Mothers

Variables	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Treatment	-.08	-.07	-.18*	-.02	.18	-.10	-.02	-.06	.01
2. Child age		.18	.03	.10	-.19*	.02	-.12	.21*	.05
3. Mother's ed			.09	-.01	-.11	-.08	-.16	-.09	-.13
4. Stress				.09	-.01	.21*	.30**	.45**	.47**
5. ParentAtt					.37**	.24**	.13	.15	.26**
6. ChildAtt						.54**	.21*	.18	.21*
7. Anger Time1							.35**	.31**	.37**
8. Anger Time2								.33**	.32**
9. Punitive Time1									.62**
10. Punitive Time3									

Note. ParentAtt = parent-centered attributions; ChildAtt = child-blaming attributions. Italicized correlations are stability coefficients.

* $p < .05$. ** $p < .01$.

Table 4

Correlations among Predictors for Harsh Punishment among Former Adolescent Mothers

Variables	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Treatment	.02	-.11	-.14	.04	-.02	-.08	-.05	.06	-.04
2. Child age		.05	.08	-.08	-.03	.09	-.06	-.01	.01
3. Mother's ed			.08	-.11	-.10	.16	-.09	-.11	-.16*
4. Stress				.09	-.06	.29**	.15	.51**	.54**
5. ParentAtt					.30**	.30**	.13	.32**	.16
6. ChildAtt						.46**	.40**	.17*	.15
7. Anger Time1							.53**	.40**	.27**
8. Anger Time2								.25**	.26**
9. Punitive Time1									.71**
10. Punitive Time3									

Note. ParentAtt = parent-centered attributions; ChildAtt = child-blaming attributions. Italicized correlations are stability coefficients.

* $p < .05$. ** $p < .01$.

Table 5

Correlations among Predictors for Harsh Punishment among Older Mothers

Variables	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Treatment	-.01	-.01	-.05	-.03	.07	.09	-.02	.08	-.05
2. Child age		.09	-.01	.03	.03	.14	.05	.04	.04
3. Mother's ed			.09	.01	-.08	.26**	-.04	.00	-.02
4. Stress				.15**	.14**	.31**	.17**	.52**	.55**
5. ParentAtt					.28**	.51**	.16**	.23**	.11
6. ChildAtt						.61**	.43**	.23**	.23**
7. Anger Time1							.38**	.46**	.27**
8. Anger Time2								.12*	.17**
9. Punitive Time1									.66**
10. Punitive Time3									

Note. ParentAtt = parent-centered attributions; ChildAtt = child-blaming attributions. Italicized correlations are stability coefficients.

* $p < .05$. ** $p < .01$.

For the adolescent mothers, correlations were examined to determine if anger could mediate the relation between attributions and harsh punishment. Child-blaming attributions at Time 1 were significantly, positively correlated with harsh punishment at Time 3 (see Table 3), meeting the first criterion for mediation. Child-blaming attributions at Time 1 were also significantly, positively correlated with anger at Time 2, and anger was positively correlated with harsh punishment at Time 3. Parent attributions at Time 1 were also positively correlated with harsh punishment at Time 3 but not with anger at Time 2. Therefore, the criteria for mediation were met in the adolescent mother group for child-blaming attributions as the predictor but not for parent-centered attributions.

Next, anger was examined as a mediator of the relation between stress and harsh punishment for the adolescent mothers. Stress was positively correlated with harsh punishment at Time 3 with a large effect size (Table 3). Stress also was positively correlated with anger at Time 2, and anger at Time 2 was positively correlated with harsh punishment at Time 3 (Table 3). Therefore, the criteria for mediation, with stress as the predictor, are met for adolescent mothers.

Turning next to the former adolescent parents, parent-centered attributions at Time 1 were not significantly correlated with punitive parenting at Time 3 or with anger at Time 2 (see Table 4). Child-blaming attributions at Time 1 also were not significantly correlated with punitive parenting at Time 3. However, child attributions at Time 1 were positively correlated with anger at Time 2 and anger at Time 2 was positively correlated with harsh punishment at Time 3. Therefore, mediation is not supported for parent-centered attributions and, by the strict Baron and Kenny (1986) guidelines, mediation is also not supported for child-blaming attributions because the predictor is not associated with the outcome. However, there does seem

to be an indirect pathway from child-blaming attributions to punishment in this group that can be tested (see McCartney, Burchinal, & Bub, 2006).

Stress was significantly, positively correlated with harsh punishment at Time 3 with a large effect size (Table 4). However, stress was not significantly correlated with anger at Time 2, so mediation of stress is not supported in the group of former adolescent mothers.

Among the older mothers, parent-centered attributions at Time 1 were not significantly correlated with harsh punishment at Time 3 (see Table 5). However, similar to the former adolescent mother group, parent-centered attributions were related to anger at Time 2, and anger at Time 2 was positively correlated with harsh punishment at Time 3. On the other hand, child-blaming attributions (Time 1) were positively correlated with harsh punishment at Time 3. Child-blaming attributions at Time 1 also were positively correlated with anger at Time 2, and anger at Time 2 was associated with harsh punishment at Time 3. Therefore, the criteria for anger as a mediator were not met for parent-centered attributions but the criteria were met for child-blaming attributions.

As in the former mother group, stress was significantly, positively correlated with harsh punishment at Time 3 with a large effect size. Stress was also associated with anger at Time 2, and anger at Time 2 with harsh punishment at Time 3 (see Table 5). The basis for mediation therefore is supported in this group between stress, anger, and punishment.

Tests of Moderated Mediation

Combined group. Three sets of multiple regression analyses were computed in order to test the hypotheses related to moderated mediation. In these analyses, parent age and age at first birth were treated as continuous predictor variables. In order to test moderation, I centered the two attribution variables at pretest and centered mother's current age and age at first birth.

Interaction terms between age and attribution, age at first birth and attribution, age and stress, and age at first birth and stress were then created. In each regression, treatment group, welfare status, child's age, mother's education, and ethnicity were included as covariates; harsh punishment at Time 3 was the outcome variable and anger at Time 2 was the mediator. The three hierarchical regressions differed only in the predictor: child-blaming attributions, parent-blaming attributions, or stress.

In the first regression analysis involving child-blaming attributions as the predictor, ethnicity and child's age were significant covariates (see Table 6). In step 2, harsh punishment at Time 1 was entered in order to control for cross-time stability; child-blaming attribution style was entered as the predictor, and mother's age at first birth and current age also were entered as predictors. Both baseline levels of punishment and child-blaming attributions accounted for substantial variance in later use of harsh punishment but neither age at first birth or current age was significant (Table 6). Parent-reported anger was entered as the mediating variable in step 3 and trended toward significance, $p = .10$, but the amount of explained variance was trivial. Finally, to test for moderation, the two interaction terms were entered that involved child-blaming attributions with age at first birth and child-blaming attributions with mother's current age. Neither interaction term approached significance, indicating that child-blaming attributions were similarly predictive of later punishment regardless of the mother's current age or age at first birth.

The next regression analysis focused on parent-centered attributions as the predictor. As shown in Table 7, ethnicity and child's age were significant covariates, and mother's education trended towards significance.

Table 6

Hierarchical Regression to Test Moderated Mediation of Child-Blaming Attributions Predicting Harsh Punishment, Combined Sample

	β	R^2_{Δ}
Step 1		.021*
Welfare receipt	.022	
Child age	.091*	
Maternal education	-.077	
Ethnicity	.107**	
Treatment group	-.040	
Step 2		.451***
Child-blaming attributions	.085**	
Punishment – Time 1	.669***	
Age at first birth	.002	
Mother’s current age	-.077	
Step 3		.003
Anger – Time 2	.055+	
Step 4		.000
Current age x CBA	-.018	
Age at first birth x CBA	.014	
R^2_{adj}		.463***

Note. For welfare receipt, 2 = received welfare; for ethnicity, 2 = White; for treatment group, 2 = intervention group. CBA = child-blaming attributions.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

In step 2, punishment at Time 1, parent-centered attributions, mother’s current age, and age at first birth were entered as predictors. Baseline levels of punishment accounted for a significant amount of variance in later use of punishment, but none of the other predictors were significant (Table 7). In step 3, anger was entered as a mediator and accounted for a small but significant amount of the variance in later use of punishment. In order to test for moderation, interaction terms were entered that involved parent-centered attribution by mother’s age and parent-centered

attributions by mother's age at first birth. The interaction term with current age and parent-centered attributions accounted for significant variance in later use of punishment, indicating that age moderates the relation between attributions and punishment. In Figure 4, the interaction between level of parent-centered attribution and use of harsh punishment is shown as it varies by age of the mother. Therefore, an adolescent mother may be more likely to be informed by parent-centered attributions in punishing her child, and the relationship between these attributions and harsh punishment will not be as strong.

Table 7
Hierarchical Regression to Test Moderated Mediation of Parent-Blaming Attributions Predicting Harsh Punishment, Combined Sample

	β	R^2_{Δ}
Step 1		.023*
Welfare receipt	.024	
Child age	.099*	
Maternal education	-.082+	
Ethnicity	.109*	
Treatment group	-.041	
Step 2		.443***
Parent-blaming attributions	.004	
Punishment – Time 1	.687***	
Age at first birth	-.012	
Mother's current age	-.063	
Step 3		.007**
Anger – Time 2	.083**	
Step 4		.010**
Current age x attributions	-.130**	
Age at first birth x attributions	.052	
R^2_{adj}		.471**

Note. For welfare receipt, 2 = received welfare; for ethnicity, 2 = White; for treatment group, 2 = intervention group.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

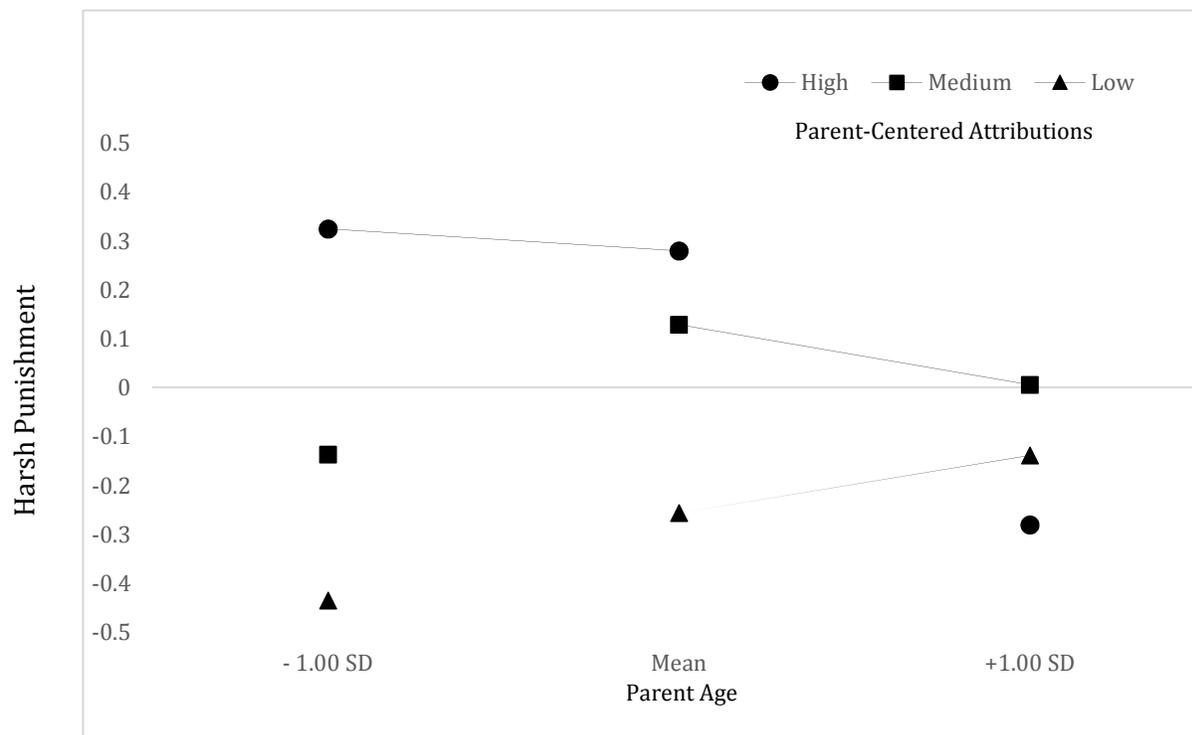


Figure 4. Harsh punishment in relation to parent age, moderated by parent-centered attributions. Age is used as a continuous variable with categories one *SD* above and below the mean. Levels of parent-centered attributions at the mean and \pm one *SD*.

The final set of regression analyses involved parent stress as the predictor. As before, ethnicity and child's age were significant covariates (see Table 8). In step 2, harsh punishment at Time 1 was again entered in order to control for cross-time stability; maternal stress was entered as a predictor, as well as mother's age at first birth and current age. Baseline levels of punishment and stress levels both accounted for a significant amount of the variance in later harsh punishment, but mother's age at first birth and current age were again nonsignificant (Table 8). Parent-reported anger was entered as a mediator in step 3, and similarly trended towards significance but again did not explain a significant amount of variance. In the last step, moderation was tested by entering two interaction terms that involved stress with age at first birth and stress with mother's current age. As seen before with the child-blaming attributions,

neither interaction term approached significance, indicating that stress levels were similarly predictive of later punishment regardless of current age or age at first birth.

Table 8

Hierarchical Regression to Test Moderated Mediation of Stress Predicting Harsh Punishment, Combined Sample

	β	R^2_{Δ}
Step 1		.023*
Welfare receipt	.026	
Child age	.101*	
Maternal education	-.081	
Ethnicity	.105**	
Treatment group	-.042	
Step 2		.487***
Parent stress	.254***	
Punishment – Time 1	.555***	
Age at first birth	-.015	
Mother’s current age	-.039	
Step 3		.003
Anger – Time 2	.057+	
Step 4		.001
Current age x stress	-.001	
Age at first birth x stress	.028	
R^2_{adj}		.503***

Note. For welfare receipt, 2 = received welfare; for ethnicity, 2 = White; for treatment group, 2 = intervention group.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

In exploratory analyses, the above hierarchical regressions were recomputed with the baseline measure of punishment removed from the model. Without controlling for baseline punishment in the model, anger partially mediates the association between child-blaming attributions and later harsh punishment ($B = .147, p = .001$); similar findings were obtained when

stress was the predictor ($B = .118, p = .001$). In these regressions, anger was a significant predictor, but child-blaming attributions and stress remained significant, supporting partial but not full mediation. Thus, anger is not irrelevant as a mediator; it just has a more limited contribution to predicting later punishment when taking into account baseline preference for punishment.

In order to avoid confirmation bias, I tested an alternate model with child-blaming attributions as the mediator between anger and harsh punishment. The correlations were significant for adolescent mothers and older mothers, but not for former adolescent mothers. The strength of correlations in this alternate model and the hypothesized model were similar, indicating that there may be a bidirectional relation between anger and child-blaming attributions.

Analyses by age group. The next series of analyses treated current age and age at first birth as categorical (attribute) predictors. As in the previous analyses, the same covariates were entered in step 1 (i.e., treatment group, ethnicity, mother's education, child's age, and welfare status); anger was tested as the mediator and punishment at Time 3 was the outcome variable. Given that the results are similar across groups, the regression analyses for the adolescent mother group will be discussed in more detail, with reference made to any substantive differences from the other two groups.

The first set of analyses by group addresses the mediation of child-blaming attributions and harsh punishment. None of the covariates explained significant variance in later punishment for the adolescent mothers, although maternal education was a significant covariate in the former adolescent mother group, and ethnicity was in the older mother group. In the second step, punishment at Time 1 was highly predictive of later use of punishment (see Table 9). Child-

blaming attributions approached significance, but did not account for a large amount of variance in later punishment. Anger was entered in step 3 as a potential mediator, but was not significant. The results were similar for the former adolescent and older mother groups (see Appendix A, Tables 12-13). Therefore, mediation is not supported in within-groups analyses because neither child-blaming attributions or anger are significantly predictive of the later use of harsh punishment in any of the three age groups. Moderation is also not supported as the variance explained in later punishment by child-blaming attributions does not differ significantly by group.

Table 9

Hierarchical Regression to Test Mediation of Child-Blaming Attributions Predicting Harsh Punishment, Adolescent Mother Group

	β	R^2_{Δ}
Step 1		.025
Welfare receipt	.048	
Child age	.071	
Maternal education	-.131	
Ethnicity	.069	
Treatment group	.018	
Step 2		.390***
Child-blaming attributions	.147+	
Punishment – Time 1	.597***	
Step 3		.007
Anger – Time 2	.090	
R^2_{adj}		.379**

Note. For welfare receipt, 2 = received welfare; for ethnicity, 2 = White; for treatment group, 2 = intervention group.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

The next set of regressions by age group tested for mediation of parent-centered attributions and harsh punishment. The same covariates were found to be significant as in the previous set of regressions. Similarly, use of punishment at Time 1, in step 2, was highly predictive of later use of punishment. Parent-centered attributions were significantly predictive in the adolescent mother group (Table 10), but not in the two older age groups (see Appendix A, Tables 14-15). Anger was entered as a mediating variable in step 3 but was not a significant predictor in the adolescent mother group. It was, however, significant in the older mother group (see Appendix A, Table 15). Based upon these analyses, it does not appear that anger mediates the relation between parent-centered attributions and later use of punishment because parent-centered attributions and anger are not both predictive in any of the groups. However, as stated previously, moderation is supported as there is differential significance between the age groups in how parent-centered attributions predict harsh punishment.

The final set of within-group analyses tests for mediation of stress and harsh punishment. As before, the same covariates as well as Time 1 punishment were predictive of later use of punishment (see Tables 11). Anger was entered as a possible mediator in step 3, but was not predictive of later punishment. These findings were similar in the former adolescent and older mother groups (see Appendix A, Tables 16-17). It is apparent that both stress and baseline use of punishment are important predictors for later punishment, but the relation is not mediated by anger. Moderation is not supported either, as the groups do not vary significantly in how stress predicts harsh punishment.

Table 10

Hierarchical Regression to Test Mediation of Parent-Blaming Attributions Predicting Harsh Punishment, Adolescent Mother Group

	β	R^2_{Δ}
Step 1		.030
Welfare receipt	.055	
Child age	.084	
Maternal education	-.138	
Ethnicity	.078	
Treatment group	.011	
Step 2		.411***
Parent-blaming attributions	.182*	
Punishment – Time 1	.616***	
Step 3		.006
Anger – Time 2	.086	
R^2_{adj}		.406***

Note. For welfare receipt, 2 = received welfare; for ethnicity, 2 = White; for treatment group, 2 = intervention group.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 11
Hierarchical Regression to Test Mediation of Stress Predicting Harsh Punishment, Adolescent Mother Group

	β	R^2_{Δ}
Step 1		.031
Welfare receipt	.047	
Child age	.082	
Maternal education	-.148	
Ethnicity	.072	
Treatment group	.016	
Step 2		.430***
Stress	.258**	
Punishment – Time 1	.519**	
Step 3		.002
Anger – Time 2	.052	
R^2_{adj}		.463***

Note. For welfare receipt, 2 = received welfare; for ethnicity, 2 = White; for treatment group, 2 = intervention group.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

Discussion

This study focused on the possible parenting differences between adolescent mothers, former adolescent mothers, and older mothers. Past research has found that adolescent mothers are more at risk for harsh and abusive parenting than are older mothers (Lee, 2009; Lee & Guterman, 2010), and I sought to discover what processes may contribute to harsher parenting in different age groups. The focus was on stress and causal attributions as predictors of harsh parenting, with anger as a mediating factor and age as a moderating factor.

In general, both types of causal attributions, stress, and anger were all positively correlated with later punishment. Overall, the adolescent mothers were more similar than different, once multiple covariates were taken into account, compared to former teen mothers and mothers who were older at first birth. Several mediational pathways were supported by correlational tests, but when baseline preference for punishment was accounted for in the regressions, anger was no longer a significant factor. This seems to indicate that anger is not irrelevant as a mediator, but may not account for heightened levels of punishment when continuity of punishment practices are taken into account. Age as a moderator was supported for parent-blaming attributions, showing that younger mothers' use of harsh punishment, as compared to older mothers, was more contingent upon their self-blaming attributions. However, the groups were similar in most areas, seeming to indicate that the parenting processes of attributions, stress, and anger may be more important predictors of harsh punishment than the age of the parent.

Group Differences

The sample was first divided into groups by age. Other research has shown that adolescent mothers differ from older mothers in important ways (e.g., Easterbrooks et al., 2011; Lee, 2009), supporting the decision to divide them into groups. An interesting contribution this study makes to the body of research was comparing current adolescent mothers both to mothers who had their children in adolescence but were older at the time of the study, and to mothers who had their children later in life. This categorization has the potential to show maturation effects in how adolescent mothers grow and develop in parenting skills and to sort out the potential contribution of mothers' current age (i.e., maturity; see Belsky, 1984) from the age at first birth.

The adolescent mothers differed from former adolescent mothers and older mothers in several demographic variables other than age. The adolescent mothers were significantly less educated and less likely to be employed than both of the older groups. They were also significantly more likely to be single than older mothers. All of these factors replicate previous findings for adolescent mothers (e.g., Easterbrooks et al., 2011; Lee, 2009; Mendes, 2009), and may affect the process variables that were studied. These factors could particularly affect stress because lower education and lower income are consistently associated with parental stress (Barajas-Gonzalez & Brooks-Dunn, 2014). However, in this study, there was not a significant difference in baseline levels of stress between the age groups, and stress seemed to be most salient to the older mothers given that they were the only group where it was significantly correlated with hostile parent and child attributions.

In terms of baseline group differences in parenting processes, there were no significant differences between age groups in stress, anger, and attributions, but adolescent mothers were

significantly *less* likely than older mothers to use harsh punishment with their children. This contrasts with previous findings that adolescents are at increased risk of harsh and abusive parenting (Lee, 2009; Lee & Guterman, 2010). This difference may in part be because the current study controlled for confounding variables, such as socioeconomic status and ethnicity, which other comparative studies may not account for. These types of demographic variables may be more strongly related to rearing practices than age of the mother. Another variable that may affect the use of punishment is the child's age. Therefore, controlling for these variables helps extend our knowledge of the impact that mothers' age may or may not have on parenting. In these comparisons, I was able to look at the processes that may affect harsh parenting and how they may differentially affect adolescent mothers.

The only process in the model that was moderated by age was parent-blaming attributions. Adolescent mothers were more likely than older mothers to use harsh punishment when they blamed themselves for problematic child behavior, suggesting that adolescent mothers are more sensitive to self-blame. Adolescents are prone to egocentrism, particularly the imaginary audience, such that they tend to focus on their own behaviors and believe that everyone else notices what they are doing (Arnett, 2012). This may cause them to focus more on their own actions in parenting and to be more strongly affected by their own self-blame, causing them to parent more harshly. Also, the evidence that adolescent mothers are different from both former adolescent mothers and older mothers indicates that the interaction between parent-blaming attributions and harsh punishment may lessen over time as the mother matures. Therefore, an adolescent mother may be more at risk during her early years of parenting, but over time the risk may lessen. An alternative explanation to this finding may include differences in the child's age. This may be especially true for the difference between adolescent mothers and

former adolescent mothers. However, child age was only correlated with parent-blaming attributions in the adolescent mothers, so the maturity of the mother may play a larger role.

Dividing the sample into groups by age assumes, as much of the current research does, that adolescent mothers are qualitatively different from older mothers, with an arbitrary cutoff when a woman reaches 20 or 21 years of age (e.g., Crugnola et al., 2013; Easterbrooks et al., 2011). However, individual maturity differs, and becoming a parent may trigger many developmental changes (Cowan, 1988; Palkovitz, 1996), reducing the effect of the age of the mother. Because of this, I also tested models using age as a continuous variable, with largely similar results. With age used as a continuous variable, the results still indicated that the only process moderated by age was between parent-centered attributions and harsh punishment.

Because this is the only process that was moderated by age, it may be that adolescent mothers may be more similar than different compared to older mothers. Although moderate age group differences were found in use of harsh punishment, the pathways in the model were generally not moderated by age, demonstrating that the parenting processes that predict use of harsh punishment may be more important than parent age. In the next section, correlations among variables in the model will be more fully explored as related to age and outcomes.

Social-Cognitive Processes Predicting Harsh Punishment

Stress was positively predictive of harsh punishment, with large effect sizes in all three age groups. This is consistent with prior research (East et al., 2012; Pereira et al., 2015; Ricketts & Anderson, 2008), and in this sample, stress was inversely related to other parenting variables such as parent and child-blaming attributions and anger regardless of the mothers' or children's ages. Stress was correlated with harsh punishment regardless of parental age, and stress was not associated with child age or mother's education, all of which suggests that stress can be

problematic for all types of mothers. For this reason, stress should be a focus of interventions for parents at risk for harsh or abusive parenting (see Hayes, Matthews, Copley, & Welsh, 2008; Petch, Halford, Creedy, & Gamble, 2012).

Also, stress was positively correlated with anger at one or both time points in all three age groups, helping to explain why stress was predictive of harsh punishment. The association between stress and anger has been demonstrated previously (Lam, 1999; Lutenbacher, 2002), and the current study adds to the body of evidence that stress can affect anger expression. Additionally, this study outlines a pathway from stress through anger to harsh punishment. This mediational pathway was supported for all three groups in correlational analyses. As stated earlier, mediation of stress by anger was not supported when baseline punishment was accounted for. This does not mean that the links between stress, anger, and harsh punishment are not important to address, though, as they are clearly interrelated and links between stress and anger help explain how stress relates to harsh punishment.

Child-blaming attributions were similarly correlated with harsh punishment in all three age groups; thus, contrary to my hypothesis, moderation by age was not supported. Other studies have consistently shown hostile child-centered attributions as risk factors for harsh parenting and abuse (e.g., Rodriguez & Tucker, 2014), a finding that was replicated in the present study, although the effect sizes were relatively small.

Earlier studies have also found that the age of the child affects the predisposition to blame children for misdeeds, and that child-blaming attributions may increase as children enter late childhood (Cote & Azar, 1997; Dix et al., 1986). In the current study, the only group in which child's age correlated with attributions was the adolescent mother group, and it was a small but significant negative correlation. The adolescent mothers mostly had children who were

infants or toddlers, so this negative correlation suggests that the teen mothers were more prone to link infant misbehavior, as compared to toddlers' behavior, with internal characteristics and intentionality. This may be due to their increased understanding in child development or their realization that their children are affected by the environment.

Child-blaming attributions were consistently associated with anger in all three age groups with medium to large effect sizes, and in turn anger was strongly correlated with harsh parenting. The pathway from child-blaming attributions to punishment, mediated by anger, was supported in correlational analyses for all age groups except the former adolescent mothers. Thus, the current study replicates other studies demonstrating that mothers who perceive their child's misbehavior as intentional become angrier in response and are therefore more likely to use harsher forms of punishment (e.g., Ateah & Durrant, 2005; Dix et al., 1990).

However, as with the mediational pathways for stress, mediation was not supported when baseline preference for punishment was taken into account. This nonsignificant pathway contrasts with Dix et al's (1990) finding that anger mediates the relationship between child-centered attributions and harsh punishment. This may be due to the difference in how anger was measured: Anger was assessed with vignettes about children's misbehavior that asked how angry the parent would become in each situation. Therefore, it was not necessarily measuring trait anger or in-the-moment anger, but a cold cognition of what they would imagine their reaction to be. In Dix et al's (1990) study, anger was measured in the moment, with responses to videotaped scenarios and in a daily journal that mothers kept, making it more clear how anger in the moment was related to attributions. The directionality between anger and attributions is still unclear, however, given that anger was both concurrently correlated with attributions and predicted by them.

Parent-blaming attributions correlated with harsh punishment at one or both time points in all three groups. This adds to the body of evidence showing that mothers who blame themselves for caregiving failures tend to parent their children more harshly (Bugental & Happaney, 2002; 2004). Some studies have shown that parent-blaming attributions tend to decline over time (Bernstein et al., 2013), indicating that parents with older children may tend to rely less on these types of attribution. As children age, mothers may be more likely to blame outside factors or the child's temperament for misbehavior than their own parenting practices. Mothers of infants and toddlers may surmise that their child is too young to be affected by anything other than the parent, thus placing more blame on themselves. One of the reasons that parent-centered attributions may be linked to harsh parenting is through increased anger.

Parent-blaming attributions and anger were positively correlated at one or both time points in all three groups, with effect sizes ranging from medium to large. One might assume that because of this association, anger may in part account for the relation between parent-blaming attributions and harsh punishment, but mediation was not supported in any of the groups. This suggests that there may be some other process that were not measure through which parent-blaming attributions result in harsher forms of punishment. For example, Martorell and Bugental (2006) found that cortisol reactivity (stress) mediated this relationship. In the present study, stress was not examined as a mediator, but it did predict harsh punishment and was associated with parent-centered attributions in the older mother group. Therefore, it seems that attributions, anger, and stress are all processes that predict harsh punishment and they relate to and interact with each other in multiple ways.

Although anger did not emerge as a consistent mediator of the associations between causal attributions, or stress, and later rearing practices, anger did correlate significantly with

harsh punishment in all groups, concurrently and predictively. As was observed, anger is associated with several processes including stress and attributions, and may partially mediate some of the pathways from these processes to harsh punishment. This study supports previous findings that parents who become angry are more likely to react more harshly to their children (Ateah & Durrant, 2005; Graham et al., 2001; Slep & O’Leary, 1998). Other studies have looked at anger as a predictor rather than a mediator and found that parents who are clinically angry or become angry in the face of a child’s misbehavior are more likely to make hostile attributions and therefore parent more harshly (Dix et al., 1990; Pidgeon & Sanders, 2012). Therefore, it appears that anger may both predict and partially mediate the relations among stress, causal attributions, and punishment, but regardless of directionality, it is an important factor in whether or not parents use harsh punishment.

Strengths and Limitations

This study has several strengths that increase its external validity. The first is a large, multiethnic sample, allowing for greater statistical power and increased generalizability. Although demographic variables were not the focus of this study, I was able to see which ones affected the process variables in significant ways and add to the body of literature that analyzes demographical influences. Another strength in the design is that it was longitudinal. Having three time points permitted a more valid test of mediation (Maxwell & Cole, 2007), and also helped to examine stability in processes over time.

The measures used were valid and reliable. However, given that all of the measures were by parent self-report, the study would have been strengthened by the inclusion of observational measures. Some of Dix et al.’s (1990; 1991) studies on attributions have examined mothers’ reactions to videos of both their own child and other children, which permits one to assess

attributions in real time and link them with emotions more closely than a questionnaire can. The measure of anger was sound, but measured anger differently than other studies on attribution and anger have. Specifically, this study did not measure ‘in the moment’ anger, but rather asked the parent to answer how angry a certain behavior would make them. This may result in generally lower levels of anger as parents may underestimate how angry they may become in a certain situation.

Implications

This study shows that process variables such as stress, anger, and parent-centered and child-blaming attributions significantly contribute to child-rearing strategies and thus are important to focus on in interventions for parents. In order to address the influence of stress and anger, parenting programs could focus on parental self-care and coping skills as part of their curriculum. Some parenting programs have implemented exercises that address parental attributions about themselves or their children, and have shown this to be effective in increasing positive parenting skills and reducing abusive parenting (see Azar, 1997; Bugental, Ellerson, Lin, Rainey, Kokotovic, & O’Hara, 2010). Also, the current study shows that baseline preference for harsh punishment significantly accounts for later use of harsh punishment. Therefore, interventionists would do well to include alternatives to punitive practices as well as focusing on anger reduction and stress management. Approaches such as behavior management (see Taylor & Biglan, 1998; Webster-Stratton, 1992) are research-based alternatives to punishment that have been used in parenting programs (Webster-Stratton, Kolpacoff, & Hollinsworth, 1988). In conclusion, process variables such as attributions, stress, and anger and preference for punitive measures have a significant impact on harsh parenting and should be addressed in prevention and intervention programs for parenting, regardless of the mother’s age.

Further research could be conducted on the directionality between attributions and anger and mediational pathways given that research has various answers to this question. In the present study, anger did not mediate the relationship between attributions and harsh punishment, with baseline punishment covaried, but others have found this pathway to be significant (Dix et al., 1990). It is likely that anger and attributions have a synergistic relation and further research could help shed more light on this interaction. Another direction of future research related to age of the mother could be to look more closely at the maturation and development of adolescent mothers over time. This study's findings indicate that adolescent mothers are more alike than different compared to their older counterparts. This is even truer for former adolescent mothers who do not differ significantly from older mothers in any of the areas explored in the current study. Therefore, if mothers of all ages are mostly similar once one takes into account demographic variables, this places more emphasis in applied research and intervention on the key processes that contribute to harsh rearing practices. These processes have been shown to be alterable with effective programming (Bugental et al., 2010), demonstrating that this should be the focus for further research and intervention.

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Appendix A

Table 12

Hierarchical Regression to Test Mediation of Child-Blaming Attributions Predicting Harsh Punishment, Former Adolescent Mother Group

	β	R^2_{Δ}
Step 1		.033
Welfare receipt	.002	
Child age	.182	
Maternal education	-.182*	
Ethnicity	.043	
Treatment group	-.065	
Step 2		.495***
Child-blaming attributions	.044	
Punishment – Time 1	.703***	
Step 3		.005
Anger – Time 2	.078	
R^2_{adj}		.506***

Note. For welfare receipt, 2 = received welfare; for ethnicity, 2 = White; for treatment group, 2 = intervention group.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 13

Hierarchical Regression to Test Mediation of Child-Blaming Attributions Predicting Harsh Punishment, Older Mother Group

	β	R^2_{Δ}
Step 1		.032+
Welfare receipt	.004	
Child age	-.025	
Maternal education	-.071	
Ethnicity	.177**	
Treatment group	-.052	
Step 2		.433***
Child-blaming attributions	.081+	
Punishment – Time 1	.641***	
Step 3		.001
Anger – Time 2	.042	
R^2_{adj}		.451***

Note. For welfare receipt, 2 = received welfare; for ethnicity, 2 = White; for treatment group, 2 = intervention group.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 14

Hierarchical Regression to Test Mediation of Parent-Blaming Attributions Predicting Harsh Punishment, Former Adolescent Mother Group

	β	R^2_{Δ}
Step 1		.034
Welfare receipt	.002	
Child age	.014	
Maternal education	-.184*	
Ethnicity	.045	
Treatment group	-.066	
Step 2		.495***
Parent-blaming attributions	-.068	
Punishment – Time 1	.730***	
Step 3		.007
Anger – Time 2	.090	
R^2_{adj}		.510***

Note. For welfare receipt, 2 = received welfare; for ethnicity, 2 = White; for treatment group, 2 = intervention group.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 15

Hierarchical Regression to Test Mediation of Parent-Blaming Attributions Predicting Harsh Punishment, Older Mother Group

	β	R^2_{Δ}
Step 1		.032+
Welfare receipt	.003	
Child age	-.022	
Maternal education	-.078	
Ethnicity	.177**	
Treatment group	-.051	
Step 2		.427***
Parent-blaming attributions	-.052	
Punishment – Time 1	.669***	
Step 3		
Anger – Time 2	.090*	.008*
R^2_{adj}		.452***

Note. For welfare receipt, 2 = received welfare; for ethnicity, 2 = White; for treatment group, 2 = intervention group.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 16

Hierarchical Regression to Test Mediation of Stress Predicting Harsh Punishment, Former Adolescent Mother Group

	β	R^2_{Δ}
Step 1		.033
Welfare receipt	-.001	
Child age	.013	
Maternal education	-.184*	
Ethnicity	.044	
Treatment group	-.065	
Step 2		.530***
Stress	.250**	
Punishment – Time 1	.573***	
Step 3		.007
Anger – Time 2	.086	
R^2_{adj}		.545***

Note. For welfare receipt, 2 = received welfare; for ethnicity, 2 = White; for treatment group, 2 = intervention group.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 17

Hierarchical Regression to Test Mediation of Stress Predicting Harsh Punishment, Older Mother Group

	β	R^2_{Δ}
Step 1		.030+
Welfare receipt	.014	
Child age	-.010	
Maternal education	-.072	
Ethnicity	.168**	
Treatment group	-.058	
Step 2		.476***
Stress	.267***	
Punishment – Time 1	.521***	
Step 3		
Anger – Time 2	.052	.003
R^2_{adj}		.495***

Note. For welfare receipt, 2 = received welfare; for ethnicity, 2 = White; for treatment group, 2 = intervention group.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .0001$.