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PARENTING AND PHYSICAL AGGRESSION ACROSS INFANCY

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PARENTING AND PHYSICAL AGGRESSION ACROSS INFANCY

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ABSTRACT

PARENTING AND PHYSICAL AGGRESSION ACROSS INFANCY

Brooke Edelman

While physical aggression is known to be common in toddlerhood, new research suggests that aggression is evident even in infancy. Further, early aggression is stable and predicts maladaptive outcomes later in life. Research supports close associations between harsh, overreactive discipline and physical aggression in early childhood. Harsh discipline encourages and maintains coercive processes in which reciprocal, transactional interchanges escalate aversive behaviors in both parent and child. In accordance with a developmental system perspective, we hypothesized that the congruency between parenting and aggression would increase with age as a result of these transactional interactions on the dyad. A normative US sample of 477 mothers of 6- to 24- month-old children reported on the frequency of aggressive child behaviors and discipline practices. Regression results indicated that both overreactive discipline and child age uniquely predict physical aggression. Though the overall interaction between age and discipline in predicting aggression was not significant, the results suggest a non-linear relationship between the variables. The relation between overactive discipline and aggression was stronger for infants older than a year. Age trends in the relation between parenting and aggression also differed by sex, with the influence of parenting stronger for girls beginning at 12 months of age. These findings further our understanding of the role of harsh discipline on aggression in the first years of life and may have important implications for the prevention and treatment of childhood behavior problems.

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INTRODUCTION

Physical aggression is normative and frequent in early childhood (Hay, 2005; Tremblay & Nagin, 2005). While aggression is known to be particularly common in toddlerhood, a growing body of research suggests that aggression is evident prior to age two (Lorber, Del Vecchio, & Slep, 2017; Alink et al., 2006; Naerde, Ogden, Janson, & Zachrisson, 2014). Aggressive behaviors have been reported in children as young as 6 months (Hay et al., 2010; Lorber, Del Vecchio, & Slep, 2015; Lorber, Del Vecchio, Slep, & Scholer, 2019). Furthermore, developmental trajectories leading to maladaptive outcomes begin in infancy, with early aggressors at risk for persistently elevated physical aggression at later ages (Hay et al., 2010; Hay et al., 2014; Lorber, Del Vecchio, & Slep, 2014). The consequences of early onset underscore the importance of identifying correlates of early aggressive behavior.

Early aggression can be understood within a transactional framework; developmental pathways to aggression rely on the continuous, dynamic interplay between the child and her environment (e.g., Greenberg, Speltz, & deKlyen, 1993; Sameroff, 1995). One pathway to early aggression is through coercive interactions between parent and child (Patterson, Reid, & Dishion, 1992). As the infant ages, her developmental trajectory is increasingly shaped by reciprocal, escalating coercive parent-child interactions. This perpetuating transactional process likely results in more pronounced associations between parenting and child aggression with age. Given early parent-child conflict sets the stage for prolonged coercive exchanges between parent and child that cumulatively lead to aggression, the period from infancy to toddlerhood marks a critical period for prevention and intervention (Patterson et al., 1992).

Development of Early Aggression

We adopt the topographic approach suggested by Tremblay (2000) in which aggression is defined by descriptive characteristics of behavior rather than the intended effect on the target. Thus, we classify overt behaviors from infants (e.g., hitting) as aggressive even if we cannot assess cognitive capacities such as intent to harm and/or means-end calculation about the impact of an aggressive act.

Aggressive behavior is a common complaint of parents of young children (Koot, Van Den Oord, Verhulst, & Boomsma, 1997). For example, a community sample of mothers with 24- to 45- month old toddlers indicated that 62% of children had aggressed against their mothers in the past 2 weeks (Del Vecchio & O'Leary, 2006). Further, aggression is common in infancy. Several researchers have found that distinct aggressive behaviors are evident as early as 6 months of age (Hay et al., 2010; Lorber et al., 2017; Naerde et al., 2014). A recent study found that over 90% of children ages 6 to 24 months engaged in at least one act of physical aggression in the past month (Lorber et al., 2019).

Meaningful inter-individual differences in aggression can be detected in early childhood. "Early starters" who exhibit high levels of aggression are at marked risk for a pattern of stable behavior problems, and this distinct trajectory appears to be in place as early as 8 months (Lorber et al., 2015; Shaw, Lacourse & Nagin, 2005). Physical aggression in infancy is associated with peer-directed physical force at 1 year (Hay et al., 2010), parent-reported aggression at 3 years (Hay et al., 2014) and parent-reported difficult temperament, low distress to limitations, elevated activity level, and nonverbal defiance (Lorber et al., 2014; Van Jeijl et al., 2006). Moreover, individual aggressive

behaviors are closely related, such that children who hit more will tend to bite, pull hair, and kick more frequently (Lorber et al., 2017).

Parenting and Aggression

Parenting is the major environmental construct implicated in the development of aggressive behaviors (Patterson et al., 1992). Disciplinary encounters provide a crucial context for shaping emotion regulation, modeling appropriate behavior, and enforcing standards of behavior (Lorber & Egeland, 2011). When discipline is excessively harsh and overactive, children engage in more problem behaviors such as aggression (Del Vecchio & O'Leary, 2006; Tremblay et al., 2004).

Power assertion has been consistently associated with early aggression (e.g., Patterson, 1986). The relation between harsh discipline and aggression has been established in infants as young as 10 months and is well-documented in toddlerhood (Belsky, Hsieh, & Crnic, 1998; Côté, Vaillancourt, Lelanc, Nagin, & Tremblay, 2006; Del Vecchio & O'Leary, 2006; Leadbeater, Bishop, & Raver, 1996; Martin, 1981). The impact of harsh parenting extends past early childhood, predicting cross-situational conduct problems and clinical impairment at school entry (Lorber & Egeland, 2011; Shaw, Bell, & Gilliom, 2000). Critical to the conceptualization of the relation between harsh discipline and aggression is its mutuality; the influence between parent and child behavior is bidirectional. Parents react with more negative caregiving to aggressive children than their non-aggressive counterparts (Rothbaum & Weisz, 1994).

The relation between harsh discipline and aggression can be understood as developing from transactional, coercive interactions. These interchanges escalate aversive behaviors in both parent and child (Patterson et al., 1992). Consider a situation where a

child responds to her parent's directive by kicking. The interaction escalates, and ultimately the child is rewarded for his aggression and the parent by the termination of the hostile interaction. In the coercive model, the child learns aggressive tactics lead to escape from aversive treatments (Patterson, 1982). Harsh discipline thus encourages and maintains coercive cycles. The impact of harsh discipline on aggression is cumulative, with increases in harsh parenting related to increases in child aggression (Leadbeater, Bishop, & Raver, 1996; Strassberg et al., 1994). For example, a parent might apply increasingly hostile actions to discipline her child, and the child may react by demonstrating increasingly aggressive behaviors to resist. Although the literature supports the role of coercive interactions in the development of aggressive behaviors (Brook, Zheng, Whiteman, & Brook, 2001; Chang & Shaw, 2016; McFayden-Ketchum, Bates, Dodge, & Pettit, 1996), the empirical support on the relation between coercive interactions and aggression in infancy is lacking.

Parenting and Age-Related Changes

The dynamic systems perspective emphasizes the influence of prior behavior on subsequent development. As a child ages, her developmental trajectory is increasingly shaped by her environment and patterns of transactional exchanges with others in the environment. The developmental model would predict the congruency between discipline and child aggression strengthens as a result of the reciprocal, coercive interchanges between the infant and parent over time. Thus, it is reasonable to expect that the influence of harsh discipline on aggression increases as the infant ages. Older infants have interacted with their caregivers for longer periods of time and the impact of coercive patterns is likely more extensive.

Parenting and discipline change dramatically as the infant develops. Dyadic conflict becomes increasingly likely as the infant ages and becomes goal-oriented and mobile, both of which support the growth of anger and aggression (Adolph & Robinson, 2015; Tomasello, Carpenter, Call, Behne, & Moll, 2005). These developmental milestones require parents to expend more effort in controlling their children and increase demands for appropriate behavior (Shaw & Bell, 1993; Shaw et al., 2000). Further, advances in children's language and assertion for autonomy prompt negotiation processes between parent and child (Spitz, 1957). As parents hold older infants and toddlers more responsible for their actions (Hoffman, 1975), the focus of parenting shifts from nurturement and positive support to direction and control (Emde, Johnson, & Easterbrooks, 1987; Kochanksa, Murry, & Harlan, 2000; Maccoby & Martin, 1983). Challenges between the parent and infant becomes more frequent as parents use more control strategies and increase demands for socially appropriate behavior, with the second year of life marked by increases in aggressive behavior and parental discipline (Kochanksa et al., 2000; Lorber et al., 2015; Shaw, Keenan, & Vondra, 1994).

As dyadic conflict increases during the shift from infancy to toddlerhood, coercive interactions emerge and strengthen (Fagot & Leve, 1998; Patterson, 1982; Lorber & Egeland, 2011). A transactional, developmental systems perspective would predict that coercive interactions strengthen as conflict increases (Patterson, 1982; Sameroff, 1995). Critical to the model is its reciprocity; the influence between parent and child behavior is bidirectional. Parents' harsh caregiving and children's behaviors are continually exerting a pull on one another and, over time, these behaviors become increasingly interwoven. As the child ages, her developmental trajectory is increasingly

embedded in the context of the caregiver relationship. It is thus reasonable to expect the link between harsh parenting practices and aggression would strengthen with time.

There is some literature to support age differences in the relation between caregiving and externalizing behaviors. Though no studies have specifically examined harsh discipline, some have explored related variables. For example, parenting efficacy, parenting daily hassles, and parental education were found to more strongly relate to externalizing behaviors in 24- and 36- month-olds than in 12-month-olds (Van Zeijl et al., 2006). Interestingly, age effects between authoritarian control and externalizing behaviors were nonsignificant. However, the authors operationalized externalizing behaviors as a broadband measure consisting of different types of problem behavior. There is some evidence to suggest that relations between maternal behavior and infant activity level and difficultness are stronger at 18 and 24 months than at 6 and 12 months (Bates, 1980b; Maccoby, Snow, & Jacklin, 1984). Other work has found that age does not interact with maternal mental distress in the prediction of physical aggression (Hay, Hurst, Waters, & Chadwick, 2011; Tremblay et al., 2004)

Less understood is how age moderates the association between harsh discipline and physical aggression specifically. Parenting practices contribute more to the prediction of aggressive behavior than other externalizing problems, and physical aggression is a better predictor of subsequent behavioral problems than non-physically aggressive behavior such as hyperactivity or noncompliance (Broidy et al., 2003; Stromshak, Bierman, McMahon, & Lengua, 2000). It is important to examine these processes in infancy, given meaningful differences in aggression observed before 2 years of age are quite stable (Alink et al., 2006; Lorber et al., 2015).

Current Study

Given empirical evidence of aggression in infants as early as 6 months, and that early aggressors show a more persistent course of antisocial behavior (Lorber et al., 2019; Shaw et al., 2005), it is important to better understand predictors of aggressive behavior. While harsh discipline has been consistently impacted as a risk factor for early aggression, less is known about how the relationship between discipline and aggression changes across the first years of life. Early intervention for child aggression is clearly indicated given that parent-child interactions are most malleable during the period from infancy to toddlerhood (Keenan & Shaw, 1994; Tremblay et al., 2004). Practice could be improved if we knew more about the developmental pathways toward early problem behaviors.

The aim of the present study is to better understand the function of age in the discipline-physical aggression relation in a nonclinical sample of mothers of infants ages 6-24 months. In accordance with a developmental systems models, I hypothesized that the relation between harsh discipline and acts of physical aggression would strengthen with age. Findings of stronger parent-child associations for older than for younger infants would support the development of aggression as a cumulative, reciprocal process between parent and child.

It is also possible that the relations between harsh discipline and aggression across age vary by child sex. The trajectory and frequency of aggressive behaviors differs between boys and girls, and these differences may emerge as early as 17 months of age (e.g., Baillargeon et al., 2007; Coie & Dodge, 1998; Miner & Clarke-Stewart, 2008). Further, parenting differentially impacts child outcomes for boys and girls. For example,

the link between parent behavior and early externalizing problems is stronger for boys (Rothbaum & Weisz, 1994; Shaw et al., 1998). While the relation between harsh discipline, physical aggression, and sex in infant populations is less studied, we expect to observe a similar trend as prior research. We thus hypothesize there will be sex differences in the association between harsh discipline and physical aggression in the second year of life, with the correlation stronger for boys than girls.

METHODS

Procedures and Participants

The study participants included 528 parents of 6- to 24- month old children recruited from Qualtrics, a marketing research firm. Research participants were recruited from several sources (e.g., social media and web publishers). To be included in the present study, the respondent needed to be an adult mother of at least one child between 6 and 24 months residing in the continental United States who was comfortable completing the surveys in English. Each mother also needed to correctly respond to a validation item to successfully pass a quality control measure for inclusion in analyses. This procedure eliminated 9.7% of qualifying parents who were insufficiently attentive, yielding a final sample size of 477.

Recruitment quotas were established to ensure an even representation of children across the 6- to 24- month age range. For example, child age quota: 16.7 +/- 5.0% in each 3-month band from 6 to 20 months and in the 4- month 21- to 24- month band. Other recruitment quotas (ethnicity and race, maternal level of education, and family income) were established to net a sample reasonably representative of the US population. Recruitment proceeded until each quota was filled. Other than child age, the quota targets were based on United States Census data.

Child age (M =14.72 months, SD = 5.25) was roughly equally distributed in the 6 age bands. Children were 52.2% male (n = 249) and 18.3% were Hispanic/Latino of any race. Among the non-Hispanic/Latino children, 60.2% were White, 13.1% were Black, 4.2% were Asian, 3.8% were mixed race, and .4% were another race. Mothers ranged from 18 to 54 years old (M = 29.95, SD = 6.16), and 18.5% were Hispanic/Latino of any

race. Among non-Hispanic/Latino parents, 59.2% were White, 13.4% were Black, 4.8% were Asian, 2.9% were mixed raced, and 1.1% were another race. Most mothers (90.8%) were married or lived with a partner. 50.3% of mothers were employed, and 29.1% had earned a bachelor's degree or higher. Annual family income was assessed in ranges: ≤ $25,000 (15.6%), $26,000 - $45,000 (24.7%), $46,000 - $65,000 (15.4%), $66,000 - $85,000 (19.4%), $86,000 - $105,000 (14.1%), and ≥$106,000 (10.8%). The exploratory variable, child age, was not significantly associated with the other demographic variables.

Parents completed on-line questionnaires that included screening and demographic questionnaires, the Child Behavior Record, the Parenting Scale Short Form and other measures not of present focus. Data collection occurred in June of 2017.

Measures

Child physical aggression. The PA subscale of the Child Behavior Record (CBR) is a measure of physical aggression in which the parent is asked to indicate the frequency of 18 child behaviors in the last month. The CBR incorporates all seven physically aggressive behaviors of the Infant Externalizing Questionnaire, which has exhibited multiple indications of reliability and validity (Lorber et al., 2014). The CBR adds items measuring additional physically aggressive acts identified by Hay and colleagues (Hay et al., 2011).

The CBR's PA subscale consists of 10 items, including kicking, pinching, biting, throwing, etc. Parents rate the frequency of each item using the following scale: *0=Never, 1=Rarely (less than once a week), 2=Some (1-3) days of the week, 3= Most (4-6) days of the week, 4=Every day of the week,* and *5=Many times each day*.

Overreactive discipline. All mothers completed a 10-item version of the Parenting Scale (Arnold, O'Leary, Wolff, & Acker, 1993), a measure of harsh/overreactive and lax/permissive discipline practices. The Parenting Scale has been validated against child behavior problems, home observations of parenting, and with item response theory (Arnold et al., 1993; Lorber, Xu, Slep, Bulling, & O'Leary, 2014). The 5-item overreactivity scale (e.g., "When my child misbehaves, I get so frustrated or angry that my child can see I'm upset") was the present focus.

Analytic Strategy

Aggression scores were skewed. Thus, we winsorized the three extreme outliers. Regression models were used to test the interaction between age and harsh discipline in predicting infant aggression. Child age and overreactive discipline were standardized prior to creating the interaction term. All regressions were conducted with nonparametric bias-corrected bootstrapped estimation (5,000 replicates) using Mplus 8.0 (Muthén & Muthén, 1998-2017). Standardized estimates (β) were evaluated relative to 95% confidence intervals. To further examine the impact of age, correlations between parenting and aggression were conducted for different age intervals. All correlations were evaluated with Spearman's rank correlation coefficient. Fisher's *Z*-tests were performed to test for differences in the strength of associations between age intervals. All regression and correlations were also examined separately by sex.

There were no missing data in the sample. Only the demographic variable child age significantly correlated with outcome variables; no other demographic variables were controlled in the statistical tests.

RESULTS

Preliminary Analyses

Occurrence of physical aggression. Table 1 shows the prevalence and frequency of mother-reported physical aggression for each age group. The mean frequency of aggression increased with age. The prevalence of aggression stayed relatively constant across 6 to 24 months, with 68% of all parents reporting at least one instance of aggressive behavior from their child (range = 62 to 76%).

Quality of harsh parenting . Harsh parenting was not associated with child age, $r_s = .045$, $p = .33$. Mothers across all age groups reported a similar likelihood of using overreactive strategies.

Harsh parenting and physical aggression. The correlation between harsh discipline and physical aggression for the overall sample was significant, $r_s = .33$, $p < .01$ (Table 2).

Primary Analyses

Impact of age. The overall interaction between age and discipline in predicting aggression was non-significant, β =.04, 95% CI [-.069, .146]. Results indicate that both overactive discipline and child age uniquely predicted physical aggression, β =.36, 95% CI [.259, .448]; β =.10, 95% CI [.020, .190].

Though the interaction was non-significant for the overall sample, we wanted to better understand the pattern of the discipline-aggression relation for each age group. Thus, we calculated the correlation between overreactive discipline and physical aggression for each age band (Figure 1). All correlations were in the expected direction, ranging from $r_s = .14$ to $r_s = .47$. The association between overreactive discipline and

aggression appeared to be largest between 12-14 months and 18-20 months. Fishers' Z tests were thus performed to test for age differences in the strength of association between discipline and physical aggression (Table 2). None of the differences between two consecutive age bands were significant.

To test for additional age effects, infants were divided into groups: young (6-months to 1 year) and old (13-months to 2 years). This division was chosen because it corresponds to an increase in dyadic conflict, in part due to the attainment of independent locomotion and goal-oriented behavior that occurs around the 1-year mark (Lorber et al., 2015). The relation between harsh discipline and aggression was stronger for infants older than 12 months than for infants ages 6-12 months, $Z = -1.72$, $p = .04$ (Figure 3). Thus, parenting appeared to exert greater effects in the second year of life.

Impact of sex. The frequency of physical aggression for each age interval was similar for boys and girls (Table 3).

As found for the full sample, age did not moderate the relation between overreactive discipline and physical aggression for either boys or girls, β =-.02, 95% CI [-.159, .119]; β =.127, 95% CI [-.035, .281]. For both boys and girls, overreactive discipline uniquely predicted physical aggression, β = .38, 95% CI [.245, .495]; β =.30, 95% CI [.149, .429]. The direct effect of age on physical aggression was non-significant for both boys and girls, β =.12, 95% CI [-.010, .251]; β =.09, 95% CI [-.038, .201].

To better understand the pattern of the relation for each sex, we computed correlations between parenting and aggression at each age interval. The pattern of the correlation differed between sexes. At younger ages, parenting and aggression were more strongly associated for boys, $Z = 2.69$, $p < .01$. After 12 months, associations between

parenting and aggression appear larger for girls, though the difference between sexes does not reach the level of significance, $Z = 1.181$, $p = .12$.

DISCUSSION

The goal of this study was to investigate the function of age in the relation between harsh discipline and early aggression. The results suggest that harsh parenting relates to physical aggression as early as 9 months of age. Our findings are somewhat consistent with this transactional, cumulative model of parent-child influence on early aggression. While there seems to be some impact of age in the relation between discipline and aggression, the interaction between age and harsh parenting in predicting aggression was nonsignificant. That is, the impact of harsh discipline on early aggression did not increase linearly with infant age.

Consistent with other literature on early aggression (e.g., Lorber et al., 2019; Hay et al., 2010; Naerde et al., 2014), nearly all parents in our sample reported physical aggression in their 6- to 24- month old infants. Further, most infants between 6 and 8 months old engaged in at least one aggressive behavior, supporting prior research that aggression is normative in the first few months of life. As reviewed previously, several maturational forces increase the prevalence of physical aggression in infancy in toddlerhood. In line with this and consistent with earlier research, the mean frequency of aggression in our sample increased with age.

Harsh parenting plays a role in the development of early aggression. In our sample, overreactive discipline and physical aggression were correlated as early as 9 months of age. To our knowledge, this is the first study to report associations between parenting and aggression so early in development. Prior to 9 months of age, aggression was not related to discipline. The first few months of life have been identified as the period during which mother and infant establish patterns of reciprocal interaction

(Crockenberg & Smith, 1982). During this time, normative developmental phenomena begin to change the infant's presence as a relationship partner. For example, the infant's achievement of upright mobility as well as the development of anger around 6 months represent dramatic developmental events that prompt changes in the affective organization of the dyad (Biringen, Emde, Camps, & Appelbaum, 1995). Such changes, together with the normative increases with aggression, contribute to the emergence of dyadic conflict and coercive cycles (Keenan, Shaw, Delliquardi, Giovannelli, & Walsh, 1998; Shaw, Owens, Giovannelli & Winslow, 2001).

By 9 months of age, infants have had ample opportunities to practice coercive patterns with their caregivers. We theorize that the relation between harsh discipline and aggression begins to coalesce, causing the association to strengthen and continue to strengthen with age. The developmental trajectory of aggression becomes increasingly embedded in the infants context, with the congruence between parent and child behavior greater at older than at younger ages.

The transition to the second year of life marks a significant development period during which parents and infants respond to new demands and physical aggression increases dramatically (e.g., Alink et al., 2006; Naerde et al., 2014; Shaw et al., 1998). Research examining infants 1 year and older generally find strong relations between maternal constructs (e.g., responsiveness) and infant difficulty, while studies of younger infants demonstrate smaller associations (e.g., Coffman, Levitt, Guacci, & Silver., 1992; Maccoby et al., 1984; Crockenberg & Acredolo, 1983). Consistent with this, we found that the association between parenting and aggression significantly increased in the second year of life. Further, while the differences were not statistically significant, the

relation between parenting and aggression peaked at two intervals: 12 and 14 months and 18 and 20 months. Parenting seemed to have the most impact during these age intervals. Perhaps these months are the most critical in the development of aggression—for example, 18 months is a critical age in the development of new skills and negative behaviors (Fagot & Hagan, 1991). It is also possible that greater mean levels of aggression during these developmental periods accounted for the stronger associations. Elevated levels of infant aggression may ensare parents in coercive cycles of behavior (Patterson, 1982). At lower levels of aggression, parent behavior may be less tied to infant behavior. This idea may help explain why the relation between parenting and aggression decreased as children approached the end of the second year, given that physical aggression begins to decline at this age (Naerde et al., 2014).

Research suggests the development of physical aggression differs between sex, with sex differences in the frequency of aggression favoring infant boys as early as 17 months of age. In our sample, the frequency of aggression was similar for boys and girls. Contrary to prior research, boys in our study did not engage in more aggression in the first 2 years life. Our results do suggest sex differences in the association between caregiving and infant aggression, though the sex effects may be more complex than previously thought. In the first year of life, the association between discipline and aggression was stronger for boys, consistent with results from meta-analyses that find stronger associations between maternal behavior and externalizing behavior for boys than for girls (Rothbaum & Weisz, 1994). In our sample, the relation between harsh discipline and aggression became larger for girls in the second year of life, though the differences were not statistically significant. While some research suggests that maternal interactions

with infant girls involve less conflict (e.g, Cunningham & Shapiro, 1984), other studies provide evidence that mothers are less likely to avoid negative exchanges, create positive emotional climates, and accept negative affect, difficultness, and irritability in infant girls than in infant boys (Putnam, Sanson, & Rothbart, 2002; Robinson, Little, & Biringen, 1993; Tronick & Cohn, 1989). If parents are less tolerant of girls' aggression, they will be more likely to react negatively, increasing the likelihood of establishing a pattern of coercive interactions. The dynamic systems perspective would suggest that infant girls' development becomes increasingly shaped by these coercive exchanges. The relation between the child's environment (in the case, the increasing dyadic conflict) and aggression increases. This model may explain why the associations between harsh discipline and aggression were stronger for girls in the second year of life.

Strengths and Limitations of Current Study

Several limitations are important to consider. Our argument rests on a transactional model. That is, we propose that coercive cycles strengthen with age. However, our study lacked a direct measure of dyadic conflict. Coercion implies an escalation between parent and infant that we did not directly measure. The stability of harsh discipline from 6 to 24 months would suggest, however, that any increases in the frequency of aggression with age were in fact more about coercive cycles rather than changes in discipline practices. That is, mothers are not necessarily getting harsher as the infant ages, but rather parenting and aggression become increasingly coalesced.

This study is also limited by lack of observational measures. Our measures were not designed to be representative of transactional, real-life interactions between mother and infant. Studies using questionnaire measures of caregiving generally yield smaller

effect sizes (Rothbaum & Weisz, 1994). Perhaps we would have seen stronger associations had we assessed harsh discipline with behavioral observation. On the other hand, some researchers have found significant correlations between parent-reported and laboratory-observed aggression at 12 months, despite the low base rate of aggressive behaviors in infancy (Hay et al., 2010).

The cross-sectional design prevents modeling behavior change within individuals. Given the analyses are not based on longitudinal data, we were unable to determine the direction of the effects or make inferences about causal relations among harsh discipline and aggression across age. Though our understanding is that normative developmental changes prompt increases in dyadic conflict and coercive cycles, which influence the development of aggression over time, it is also possible that early forms of infant aggression prompt harsh parenting. A longitudinal design would inform our understanding of the development of coercive patterns and their influence on child development.

Finally, our analyses of sex differences may be underpowered. When we separate the overall sample by both age and sex, the corresponding sample sizes may be too small to detect significant effects. Further, the size of our sample did not allow for analyses of sex differences at different age intervals during early development.

Despite these limitations, there are several strengths of the current study. This research represents the first investigation of the impact of age in the relation between harsh discipline and physical aggression in infancy. Thus, the research contributes to the knowledge about the development trajectories of aggression in early childhood. The study's methodology reduced the demand characteristics of the study; it is reasonable to

expect that mothers would be more likely to report on harsh parenting practices in the absence of an experimenter. Finally, the overall sample size of this study was large, and the sample was representative of the US population.

Conclusions and Implications

In conclusion, our results both support and transcend previous research about relations between parenting and physical aggression in infancy. First, aggression is common even as early as 6 months. Moreover, the frequency of aggression increases with age before beginning to decline around the end of the second year. These results can guide health care providers in advising parents about early physical aggression and providing parents with information regarding the normal developmental course of early aggression.

Although physical aggression is normal, individual differences in early aggression are consequential and associated with adverse outcomes (Campbell, Spieker, Burchinal, Poe, & NICHD Early Child Care Research Network, 2006). Our findings draw attention to an important family risk factor in the development of early aggression. The present results provide evidence that discipline practices and aggression are related in infants as young as 9 months of age. Further, the relation between parenting and aggression demonstrates some trends with age, with the association strengthening in the second year of life. These findings support a dyadic intervention model in which the parent-child relationship, rather than the individual child or parent alone, is the appropriate and critical target for treatment. For example, providers can educate parents on appropriate ways to respond to aggression. The first year of life may be the best time for providers to

intervene before coercive patterns become ingrained and stabilize, which may occur as early as the second year.

Table 1

Occurrence of Physical Aggression

Age (months)		Frequency			
	Prevalence	*M*	*SD*	Min	Max
6-8	64%	.79	.75	.00	2.90
9-11	62%	.79	.79	.00	4.70
12-14	75%	.96	.77	.00	4.70
15-17	68%	.91	.61	.00	3.10
18-20	64%	1.1	.90	.00	3.90
21-24	76%	1.0	.91	.00	4.80
Total Sample	68%	.93	.78	.00	3.90

Table 2

Correlations between Harsh Discipline and Aggression across Age

Age (months)	r_s	Age Differences
6-8	0.14	-
9-11	0.25*	.72
12-14	0.41**	1.1
15-17	0.30*	-.80
18-20	0.47**	1.27
21-24	0.26*	-1.54
Total *Sample*	.33**	-

Note. Age differences were investigated using Fisher's *Z* tests.
*$p < .05$; ** $p < .01$

Table 3

Occurrence of Physical Aggression and Spearman Correlations between Harsh Discipline and Aggression across Age in Boys and Girls

	Boys		Girls	
Age (months)	Mean (SD)	r_s	Mean (SD)	r_s
6-8	.84(.77)	.32	.75(.74)	-.03
9-11	.79(.81)	.48**	.77(.64)	-.05
12-14	.96(.63)	.31	.94(.80)	.51**
15-17	.89 (.13)	.28	.94(.68)	.23
18-20	1.26(.96)	.37**	.97(.83)	.54**
21-24	.92(.89)	.23	1.05(.85)	.33*
Total	.95(.80)	.35*	.91(.77)	.29**

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

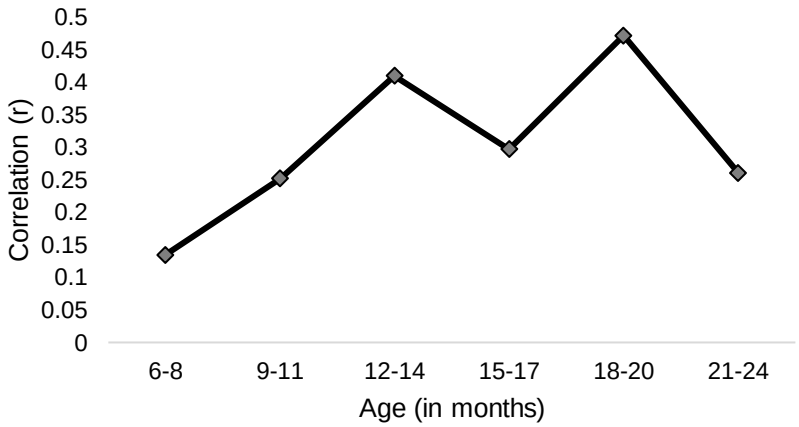

Figure 1. Spearman correlations between discipline and aggression across age.

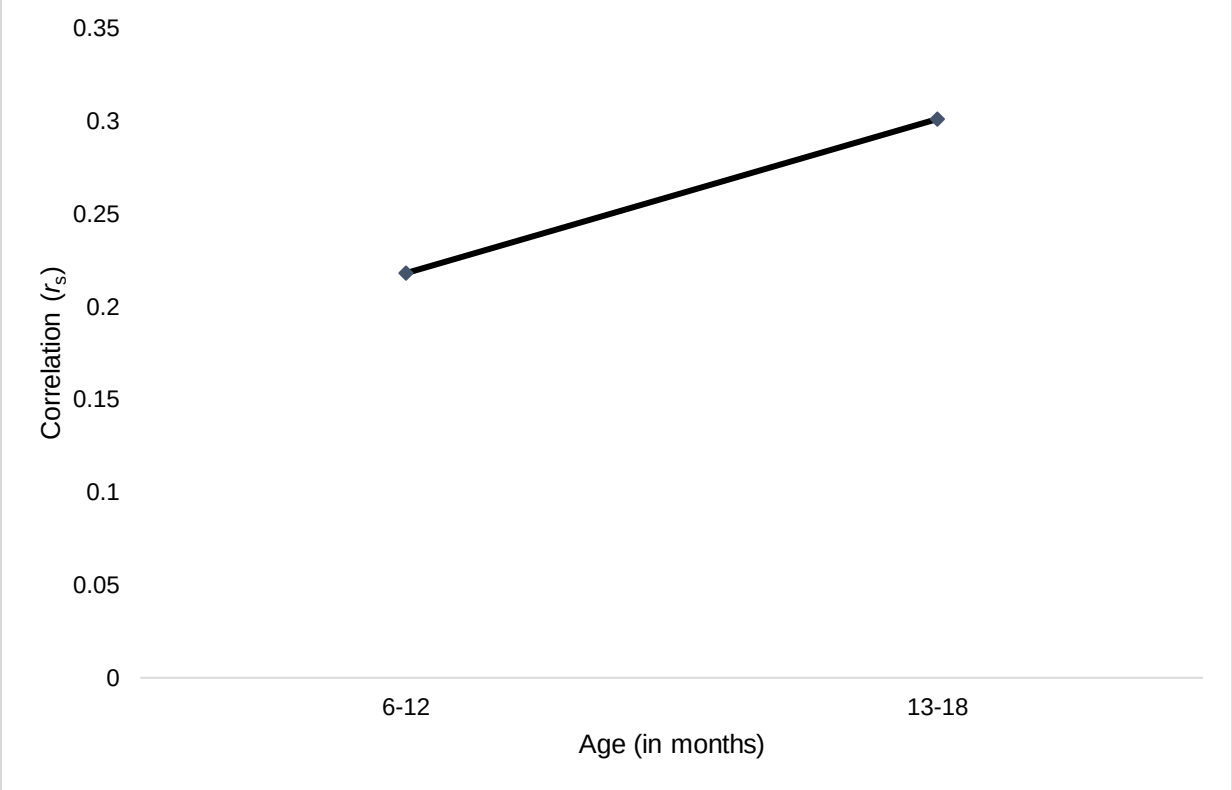

Figure 2. Spearman correlations between discipline and aggression between first and second year.

Appendix A

Demographics Questionnaire

1. How old are you? (years) _____***Eligible if greater than or equal to 18***

2. Are you a mother?
   ☐ Yes *Eligible*
   ☐ No
   ☐ Prefer not to answer

3. How many children between 6 and 24 months do you have? _____ ***Eligible if greater than or equal to 1***

4. Do you live in the continental U.S. (i.e. one of the 50 states)?
   ☐ Yes ***Eligible***
   ☐ No
   ☐ Prefer not to answer

5. Are you comfortable answering questions in English for this survey?
   ☐ Yes ***Eligible***
   ☐ No
   ☐ Prefer not to answer

Demographic Questions (if ***eligible***)

6. How old is your youngest or only child between 6 and 24 months? We will refer to this child as the "**target child.**" _____

7. Is the **target child** of Hispanic, Latino or Spanish origin?
   ☐ Yes
   ☐ No
   ☐ Prefer not to answer

8. What is the **target child's** race? You can choose more than one category.
   ☐ American Indian or Alaska Native
   ☐ Asian
   ☐ Black or African American
   ☐ Native Hawaiian or Other Pacific Islander
   ☐ White
   ☐ Prefer not to answer

9. Are you married or living with a partner?
   - ☐ Yes
   - ☐ No
   - ☐ Prefer not to answer

10. Not counting you and the target child, how many other people live with you?

    _____

11. What is your family income per year, before taxes?
    - ☐ $0-$25,000
    - ☐ $26,000-$45,000
    - ☐ $46,000-$65,000
    - ☐ $66,000-$85,000
    - ☐ $86,000-$105,000
    - ☐ $106,000 or more
    - ☐ Prefer not to answer

12. What is your highest level of education?
    - ☐ High school diploma, GED, or less
    - ☐ Some college, no degree
    - ☐ Associates degree
    - ☐ Bachelors degree
    - ☐ Graduate or professional degree
    - ☐ Prefer not to answer

13. Are you of Hispanic, Latino, or Spanish origin?
    - ☐ Yes
    - ☐ No
    - ☐ Prefer not to answer

14. What is your race? You can choose more than one category.
    - ☐ American Indian or Alaska Native
    - ☐ Asian
    - ☐ Black or African American
    - ☐ Native Hawaiian or Other Pacific Islander
    - ☐ White
    - ☐ Prefer not to answer

15. What is your employment status?
    - ☐ Employed full time
    - ☐ Employed part time
    - ☐ Not employed, seeking employment

☐ Not employed, not seeking employment
☐ Prefer not to answer

Appendix B

Child Behavior Record, PA Subscale (CBR-PA)

Instructions: Here is a list of some behaviors that are common in young children. We want to know how often the target child (*the 6- to 24-month-old you identified at the beginning of this survey*) did each of these things in the past month.

	How many times a week did your child…	Never	Rarely (less than once per week)	Some (1-3) days of the week	Most (4-6) days	Every day of the week	Many times each day	Prefer Not to Answer
1	Kick someone	0	1	2	3	4	5	777
2	Scratch someone	0	1	2	3	4	5	777
3	Get upset when removed from something s/he was interested in but should not be getting into	0	1	2	3	4	5	777
4	Pull someone's hair	0	1	2	3	4	5	777
5	Keep doing things even after an adult tried to get him/her to stop	0	1	2	3	4	5	777
6	Keep playing with objects when told to leave them alone	0	1	2	3	4	5	777
7	Hit or smack someone (with hand or object)	0	1	2	3	4	5	777
8	Keep going someplace even when told "stop," "come here," "no-no," or something like that	0	1	2	3	4	5	777
9	Pull away/ wriggle/ resist when restrained (for example during dressing, in a car seat, when diapering)	0	1	2	3	4	5	777
10	Pinch someone	0	1	2	3	4	5	777
11	We just want to see if you're still awake. Please select "Many times each day."	0	1	2	3	4	5	777
12	Hurt animals (for example, hair/fur	0	1	2	3	4	5	777

	pulling, scratching, hitting, pinching)							
13	Bite someone -*not* including nursing -even if s/he does not have teeth yet	0	1	2	3	4	5	777
14	Push or shove someone	0	1	2	3	4	5	777
15	Cry or fuss	0	1	2	3	4	5	777
16	Have a tantrum	0	1	2	3	4	5	777
17	Throw an object at someone	0	1	2	3	4	5	777
18	Swipe at someone without making contact	0	1	2	3	4	5	777
19	Forcefully take away an object (e.g., toy) that someone else was holding	0	1	2	3	4	5	777

Appendix C

Parenting Scale (IRT) Short Form

Instructions: At one time or another, all children misbehave or do things that could be harmful, that are "wrong", or that parents don't like. Example include:

hitting someone	whining	not picking up toys
forgetting homework	throwing food	refusing to go to bed
having a tantrum	lying	wanting a cookie before dinner
running into the street	arguing back	coming home late

Parents have many different ways or styles of dealing with these types of problems. Below are items that describe some styles of parenting.

Below are items that describe some styles of parenting. For each item, fill in the circle that best describes your style of parenting during the past month with the target child *(the 6- to 24-month-old you identified at the beginning of this survey).*

SAMPLE ITEM:

At meal time…

I let my child decide how much to eat.	○····○····●····○····○····○····○	I decide how much my child eats.

1. When my child misbehaves…

I usually get into a long argument with my child.	○····○····○····○····○····○····○	I don't get into an argument.

2. I threaten to do things that…

I am sure I can carry out.	○····○····○····○····○····○····○	I know I won't actually do.

3. When my child misbehaves…

I raise my voice or yell.	○····○····○····○····○····○····○	I speak to my child calmly.

4. When there is a problem with my child…

things build up and I do things I don't mean to do.	○····○····○····○····○····○····○	things don't get out of hand.

5. When my child doesn't do what I ask…

I often let it go or end up doing it myself.	○····○····○····○····○····○····○	I take some other action.

6. When I give a fair threat or warning…

I often don't carry it out.	○····○····○····○····○····○····○	I always do what I said.

7. When my child misbehaves…

I handle it without getting upset.	○····○····○····○····○····○····○	I get so frustrated or angry that my child can see I'm upset.

8. When I say my child can't do something…

I let my child do it anyway.	○····○····○····○····○····○····○	I stick to what I said.

9. When my child does something I don't like, I insult my child, say mean things, or call my child names…

never or rarely.	○····○····○····○····○····○····○	most of the time.

10. If my child gets upset when I say "No"…

I back down and give in to my child.	○····○····○····○····○····○····○	I stick to what I said.

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