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## Differential Harsh Parenting and Sibling Differences in Conduct Problems: The Role of Effortful Control

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DIFFERENTIAL HARSH PARENTING AND SIBLING DIFFERENCES  
IN CONDUCT PROBLEMS:  
THE ROLE OF EFFORTFUL CONTROL

A Thesis Presented

by

YELIM HONG

Submitted to the Graduate School of the  
University of Massachusetts Amherst in partial fulfillment  
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Psychology

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## ABSTRACT

### DIFFERENTIAL HARSH PARENTING AND SIBLING DIFFERENCES

#### IN CONDUCT PROBLEMS:

#### THE ROLE OF EFFORTFUL CONTROL

FEBRUARY 2021

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Differential parenting has been shown to be an important correlate and possible cause of positive and negative adjustment of sibling children. However, it is not known whether sibling differences in temperament affect this link between differential harsh parenting and sibling differences in adjustment outcomes. The current study addressed this gap in knowledge. The sample included 92 monozygotic (MZ, 63% female) twin pairs and 137 dizygotic same-sex (DZ, 52% female) twin pairs who had complete temperament survey data collected near the third annual wave in the longitudinal study. Children were 6.09 years old ( $SD = .69$ ) years old at wave 1. Mothers completed questionnaires, and mother and child were observed interacting during a home visit. Within families, greater sibling differences in conduct problems were statistically predicted by greater differences in harsh parenting exposure between siblings, but not by differences in effortful control. A hypothesized two-way interaction between sibling differences in harsh parenting and differences in effortful control was not significant. Regarding statistical bidirectional “child effects”, greater sibling differences in harsh parenting exposure were statistically predicted by greater sibling differences in conduct problems and greater sibling differences in effortful control. A hypothesized two-way interaction between conduct problems and effortful control was not significant. There

was evidence of a bidirectional association between differential harsh parenting and sibling differences in conduct problems. In order to study proximal family process, it is important to investigate sibling differences using within-family designs. Results can inform parents about how their differential parenting practices may affect child behavioral outcomes, to keep in mind when they parent their children.

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# CHAPTER 1

## INTRODUCTION

### Overview

Parents have a significant impact on the health and development of children (Bornstein, 1995). They can affect their children's socio-emotional, personality, attachment, and cognitive development. Positive parenting behavior is linked with the development of cognitive functioning and behavioral regulation in children. In contrast, negative parenting contributes to the development of emotional-behavioral problems, such as conduct problems, antisocial behavior, and aggression (Patterson, 1982; Grusec, 2011). Conduct problems refer to the behavioral dimensions that include disobedience, irresponsibility, destructiveness, impertinence, negativism, distractibility, fighting, attention-seeking, tantruming, hyperactivity, irritability, and inattentiveness (e.g., Peterson, 1961). Patterson's (1982) coercive family process model proposes that ineffective parenting is a major source in the development of childhood conduct problems. It stresses the importance of focusing on parenting behavior when studying child conduct problems and antisocial behaviors. In particular, the discipline tactics parents use to ameliorate child misbehavior are thought to influence the development and persistence of conduct problems and other behavioral problems during childhood (Patterson, 1997). Also, these problem behaviors elicit escalation of negative parenting behavior (e.g., Frick, Cornell, Barry, Bodin, & Dane, 2003; Gardner, Ward, Burton, & Wilson, 2003; Patterson, 1982; Shaw & Bell, 1993; Smith et al., 2014).

Harsh parenting includes coercive behaviors and negative emotional expressions that parents direct toward children that are psychologically, and sometimes physically, controlling, and punitive. This can include verbal aggression (e.g., shouting/yelling, threatening, or shaming) and physical aggression (e.g., striking,

spanking or hitting; Chang, Schwartz, Dodge, & McBride-Chang, 2003). Social learning theory has suggested that parents' use of harsh parenting discipline causes subsequent child conduct problems and aggression. This theory has proposed that if parents use aggressive forms of discipline, children learn to become more aggressive (Baumrind, 1993; Patterson, Reid, & Dishion, 1992). Many studies have shown that harsh and authoritarian discipline by parents is associated with behavior problems in children (Baumrind, 1993; Patterson et al., 1992; MacKenzie, Nicklas, Brooks-Gunn, & Waldfogel, 2014; Stormshak, Bierman, McMahon, & Lengua, 2000). Harsh, coercive, and conflictual parenting practices are strong risk factors for the development of conduct problems in children (Odgers et al., 2008; Scaramella & Leve, 2004; Shaw, Gilliom, Ingoldsby, & Nagin, 2003; Smith et al., 2014; Waller et al., 2012). Also, the use of physical discipline leads to subsequent child aggression, delinquency, and other antisocial behavior (Baumrind, 1993; Flouri & Midouhas, 2017; Gershoff, 2002; Zubizarreta, Calvete, & Hankin, 2019). Children who have been treated with harsh and coercive parenting are more likely to learn aggressive approaches to their social relationships, through operant conditioning and modeling (Dodge et al., 1990; Patterson et al., 1992).

### **Parenting and Child Effortful Control**

In addition to harsh parenting, child temperament can contribute to children's conduct problems and other behavioral and emotional problems. Different child temperaments shape different parenting styles, and the effects of those parenting behaviors on children's development (Lerner, 1993). Child temperament indicates biologically-based individual differences in the regulation and stimulation of emotional, attentional, and motor reactivity (Rothbart & Bates, 2006). Temperamental features in

early childhood are moderately stable across time and become the basis for later personality (Rothbart & Bates, 2006).

Bronfenbrenner and Morris's (1998) bioecological model proposes how particular parenting processes, in combination with child-specific characteristics including temperament, differentially affect the child's development. Variance in parenting behaviors directed at the child has been shown to be associated with child temperamental features, reflecting bidirectional child and parent effects (Chen, Deater-Deckard, & Bell, 2014; Coplan, Reichel & Rowan, 2009). Each child's individual characteristics evoke different parenting behavior and moderate the effects of parenting on the child's behavior development (Maccoby, 1999; Bates & Pettit, 2007; Bates et al., 2012; Chen et al., 2014; Rothbart, 2007; Rothbart et al., 2006).

Among child temperament attributes, the child's effortful control has been found to be an important predictor of conduct problems (Chang, Olson, Sameroff, & Sexton, 2011; Eisenberg et al., 2009; Lengua et al., 2008). Effortful control is a self-regulatory construct, and it is defined as the ability to suppress a dominant response and to perform a subdominant response (Rothbart, 1989). This self-regulatory aspect of children's temperament plays a critical role in their development and socialization (Kochanska, Murray, & Coy, 1997).

Children who have lower levels of effortful control are less effective in using coping strategies for dealing with stresses in the environment. They have limited ability in shifting attention from immediate fulfillment to its subsequent consequences, which in turn leads them to more likely to show impulsive and disruptive behaviors (Karreman, Tuijl, & Aken, 2009; Olson, Sameroff, Kerr, Lopez, & Wellman, 2005). In contrast, children with higher levels of effortful control are more likely to inhibit impulses on

their own and regulate their behavior appropriately in response to environmental demands. A number of studies have found that effortful control is negatively associated with concurrent and subsequent externalizing problems (Chen et al., 2014; Eisenberg et al., 2005; Karreman et al., 2009; Kochanska & Knaack, 2003; Zhou et al., 2007).

Children's effortful control is not independent of harsh parenting risk factors in explaining the development of child conduct problems, and child effortful control and harsh parenting can interact in their effects (Calkins, 1994). A number of studies have shown that each child's level of effortful control moderates the effects of harsh parenting on the child's conduct problems. Specifically, some studies have shown that low levels of child effortful control can augment the link between harsh caregiving and child conduct problems (Belsky, Hsieh, & Crnic, 1998; Chen et al., 2014; Edwards & Hans, 2015; Zubizarreta et al., 2019). For example, one study showed that the relationship between maternal hostility and child conduct problems was stronger for those who were low in effortful control (Morris et al., 2002). On the other hand, higher levels of child effortful control may play a protective role in the context of parental harsh discipline (Gartstein & Fagot, 2003; Morris et al., 2002). For example, Lengua (2006) found that the association between inconsistent and physical discipline and child conduct problems was weaker for children with higher levels of effortful control.

However, not all studies find the interaction effects between harsh parenting and child effortful control in the prediction of child conduct problems (Gartstein et al., 2003; Karreman et al., 2009; Olson et al., 2005). Thus, there are some inconsistent findings regarding the moderating role of child effortful control on the association between harsh parenting and child conduct problems when using a between-family design. However, in spite of the mixed findings, it is reasonable to conclude that there

is a potential interactive combination of higher harsher parenting and lower effortful control, that predicts higher levels of conduct problems.

### **Sibling Differences**

The research described so far has focused almost entirely on one child per family, yet most families have multiple sibling children, and siblings differ in their temperaments and levels of conduct problems (Browne et al., 2018; Mullineaux, Deater-Deckard, Petrill, & Thompson, 2009). Siblings can be strikingly different from one another, and they have different experiences with the same parents, even though they are being reared in the same home (Dunn & Plomin, 1990; Mullineaux et al., 2009). These differential experiences have been shown in behavioral genetic studies, estimated as nonshared environment effects. The nonshared environment, defined as non-genetic influences that account for sibling dissimilarity, contributes significantly to the development of children in a family and specifically contributes to different outcomes in siblings (Daniels, Dunn, Furstenberg & Plomin, 1985). Siblings share genes and many environmental factors, such as family structure, social class, and neighborhood conditions, which are thought to lead to behavioral similarities between siblings. However, nonshared family experiences, such as differential parenting, may explain the many differences between siblings (Daniels & Plomin, 1985; Deater-Deckard et al., 2001; Jeannin & Van Leeuwen, 2015). Differential parenting study designs require the selection of two children rather than one child, per family, and examine the effects of child-specific, within-family differences (Plomin & Daniels, 1987).

Several studies have found that differential parenting has been shown as an important source of understanding the positive and negative adjustment of siblings (Brody, Stoneman, McCoy, & Forehand, 1992; Padilla, McHale, Updegraff, & Umaña-

Taylor, 2016). Typically, siblings are exposed to different levels of harsh and supportive parenting. These differential parenting practices predict the development of individual differences in adjustment (Dunn, Stocker & Plomin, 1990; Jeannin & Van Leeuwen, 2015). The child who has been treated with harsher and less supportive parenting manifests poorer social-emotional adjustment and more problematic behaviors compared to his or her sibling, cross-sectionally and longitudinally (Asbury, Dunn, & Plomin, 2006; Burt, McGue, Iacono, & Krueger, 2006; Deaer-Deckard et al., 2001; Mullineaux et al., 2009). Also, differential parental hostility can affect changes in sibling delinquency directly. In one study, the sibling treated with more hostility by his or her parent exhibited more delinquent behaviors compared to his/her sibling (Conger & Conger, 1994).

Social comparison theory proposes that different parental treatment has a negative impact on self-esteem and adjustment for children who perceive themselves worse off than their siblings (McGuire, Dunn, & Plomin, 1995). Multiple studies have shown that less favored siblings have higher levels of externalizing behavior and adjustment problems (Feinberg & Hetherington, 2001; Jeannin & Van Leeuwen, 2015; Solmeyer & McHale, 2017; Tamrouti-Makkink, Dubas, Gerris, & van Aken, 2004). The sibling who perceives receiving harsher parenting compared to the parenting their sibling is receiving exerts differentiating influences on adjustment, exerting a negative impact on the sibling receiving the harsher parenting (McGuire et al., 1995; Jensen & McHale, 2017).

Traditionally, developmental research to examine the role of temperament in the link between parenting behavior and child behavioral outcomes has focused on a single “target child” in a family, using a between-family design (Crouter et al, 1999).

Since such between-family studies only capture outcomes for one child in the family, they cannot identify salient differences in individual development between children within the same family (Daniels & Plomin, 1985) that may vary depending on siblings' temperaments. The between-family design oversimplifies children's family circumstances and does not capture well the environmental heterogeneity in each family, which may reduce our ability to understand the effects on socialization in children (Daniels & Plomin, 1985). Family Systems theory (Minuchin, Fishman, & Minuchin, 1981) also addresses the need for examining within-family variations in parent-child relationships. The family is a complex and interconnected social system. Family System theory considers the marital dyad, sibling dyad, each parent-child dyad, triads, and even the whole-family level. A basic premise in family system theories is that the whole of the family system is greater than the sum of its parts and its properties cannot be understood simply from combined characteristics of each part. Therefore, the current study takes this theoretical approach toward exploring within-family processes and how they function to create differences between siblings.

Thus, one major gap in this literature is that although there has been considerable research examining the potential moderation effect of child effortful control using a between-family design (Belsky et al., 1998; Chen et al., 2014; Morris et al., 2002, Lengua, 2006), to my knowledge, there are no within-family design studies that have tested for a potential temperament moderation effect on the association between parenting traits and child's behavioral outcomes. Specifically, I examined two twin children per family, so that I could directly test the environmental heterogeneity in each family, to investigate potential child-specific effects within the same family.

## **Study Aims and Hypotheses 1**

The first aim of the current study was to examine whether differential harsh parenting of twin siblings, and siblings' different levels of effortful control, together statistically predicted sibling differences in their levels of conduct problems. I hypothesized that sibling differences in harsh parenting exposure and sibling differences in effortful control both would statistically predict sibling differences in conduct problems, such that the sibling who is treated with harsher parenting and who has lower levels of effortful control will show more conduct problems than his or her sibling.

The second aim was to explore the role of child effortful control, and whether sibling differences in effortful control statistically moderated the link between differential harsh parenting and sibling differences in conduct problems within families. Based on prior empirical evidence and theory, I hypothesized that within the same family, sibling differences in effortful control would moderate the association between differential harsh parenting and sibling differences in conduct problems. That is, the interactive combination of higher levels of harsher parenting and lower levels of effortful control will best predict higher conduct problems, within families. Thus, the child who receives harsher parenting and has lower effortful control will have higher levels of conduct problems, compared to the sibling.

### **Bidirectional Effects.**

As noted in the literature review, each sibling has distinct characteristics, and these can shape differential parental treatment in parent-child relationships. The same parent reacts differently to siblings who have different temperaments. Different experiences with parents contribute to siblings becoming more different from one another (Crouter et al, 1999; Jeannin & Van Leeuwen, 2015; Lam, Solmeyer, & McHale,



2012). In addition, children are not passive recipients of environmental influences. Rather, they also affect their environments and their personal traits evoke different responses from others (Scarr & McCartney, 1983). Specifically, a child who exhibits more behavior problems is more likely to elicit more harsh parenting from parents (Frick, Cornell, Barry, Bodin, & Dane, 2003). Furthermore, there is reason to believe that there may be an interactive combination of higher conduct problems and lower effortful control, that will best predict higher harsh parenting.

As siblings elicit different reactions from their parents when they act in different ways, these child-driven processes may also contribute to the differential parenting environments they experience (Turkheimer & Waldron, 2000; Lam et al., 2012). Parents are aware of the differences between their children and these differences are reported to be the main driver of differential treatment (McHale & Crouter, 2003). Since the relationship between parent and children is bidirectional and reciprocal, we need to consider this in the examination of sibling differences (Lam et al., 2012).

To examine whether there is correlational evidence for these potential child effects, the third aim was to explore whether sibling differences in levels of conduct problems and effortful control statistically predicted differential parenting treatment within a family. I hypothesized that sibling differences in conduct problems and sibling differences in effortful control would statistically predict sibling differences in harsh parenting exposure. Specifically, the child with more conduct problems and lower levels of effortful control would receive harsher parenting treatment, compared to the sibling.

## **Study Aims and Hypotheses 2**

The fourth and final aim was to explore whether the association between

sibling differences in conduct problems and differential harsh parenting exposure is moderated by sibling differences in effortful control. I hypothesized that sibling differences in effortful control would moderate the association between sibling differences in conduct problems and sibling differences in harsh parenting exposure. That is, there would be the interactive combination of higher conduct problems and lower effortful control, that best predicts higher harsh parenting within families. Thus, being a child with both higher levels of conduct problems and lower levels of effortful control will best predict harsher parenting, compared to the sibling.

## CHAPTER 2

### METHOD

#### Participants

The longitudinal data are from the third wave of the Western Reserve Reading Project (Petrill, Deater-Deckard, Thompson, DeThorne, & Schatschneider, 2006). There were 92 monozygotic (MZ, 63% female) twin pairs and 137 dizygotic (DZ, 52% female) same-sex twin pairs (age  $M = 6.12$  yrs,  $SD = 0.69$  yrs, range = 4.32 – 7.92) at intake and two annual assessments followed. For the current study, we used the subsample of families who completed child temperament surveys, close in time to the third annual wave of the longitudinal study. This sample included 75 MZ twin pairs (150 individuals) and 98 DZ same-sex twin pairs (196 individuals). Parental education varied across families, but fathers and mothers were similar on average: 12–17% high school or less, 23–29% some college or associates degree, 30–31% bachelor's degree, 4–6% some post-graduate education, and 5% post-graduate degree. Nearly all were Caucasian (92%) and the majority lived in two-parent households (6% single mothers).

#### Procedure

During a home visit, the twins and mothers completed two 10-min cooperative tasks. The mothers were asked to interact with each twin separately and the interactions were videotaped. They completed two mildly frustrating games which require their cooperation and constant task persistence. These structured tasks included drawing pictures using an Etch-A-Sketch drawing toy (e.g., drawing a house together) and moving a marble through a tilting wooden maze box. The mother and child were assigned one of two control knobs for each of the tasks and were instructed not to touch each other's dials. These videotaped tasks were later coded by trained research

assistants using the Parent-Child Interaction of global ratings (PARCHISY; Deater-Deckard, Pylas, & Petrill, 1997). At the time of the home visit, parents completed a set of questionnaires regarding their feelings about each twin and each child's behavior problems. Testers also completed questionnaires about the child's temperament and behaviors when the home visit was completed. At around the time of the home visit (on average, one month prior), we mailed a supplemental questionnaire that included ratings of each twin's temperament to all participating parents. A subgroup of parents ( $n = 197$ ) returned this questionnaire.

## Measures

**Harsh parenting measures.** Maternal harsh parenting was measured using observers' ratings and self-reported behaviors and parents feelings questionnaire.

Trained research assistants coded the videotaped parent-child interaction after each home visit using the widely used Parent-Child Interaction of global ratings (PARCHISY; see Deater-Deckard *et al.*, 1997). They viewed the videotaped interaction and rated mothers' behavior during the two structured tasks with the child on a questionnaire of items rated on 7-point Likert-type scales. Two different observers coded each twin within a pair to reduce rater bias effects. Coders achieved Cronbach's  $\alpha > .75$  during training (Bakeman & Gottman, 1997) and retained this level of reliability throughout data collection. For the harsh parenting measure, PARCHISY items regarding "*negative control*" use of physical control of dials or child's hand/arm/body, use of criticism (1= no negative control shown, 7= exclusive use of criticism and physical control of dials and/or child's hand/arm/body), *negative affect-rejection: frowning, cold/harsh voice* (1 = no negative affect displayed, 7= constant negative affect – always scowling/frowning, voice always in harsh tones), and *conflict: minor*

*or major disagreement – mutual or shared negative affect; arguing, tussling over toy* (1= no evidence of conflict during task, 7= highly conflicted interaction for entire task) were used and these items were averaged to yield a single score.

Also, each mother rated her relationship with each child using the widely used Parent Feelings Questionnaire or PFQ (Deater-Deckard, 2000). There were 24 items rated on a 1- to 5-scale (1 = definitely untrue to 5 = definitely true). These items included a 13-item *Negativity* scale ( $\alpha = .90$ ) and they were averaged to yield a single score. The negativity scale includes item such as, “Sometimes I am not happy about my relationship with this child”, “This child and I fight or argue more than I would like to.”, and “Sometimes this child’s behavior makes me so angry I can barely stand it.” The current study dataset had three annual waves of test-retest reliability data for both scores:  $r = .58$  to  $.83$  for negativity; see Deater-Deckard et al., 2009. The observer’s ratings on the PARCHISY and self-reported questionnaire ratings on the PFQ were not correlated enough to justify calculating a single cross-informant harsh parenting composite score, so they were analyzed separately.

**Child conduct problem measures.** Mothers assessed her perceptions of child behavior problems using the externalizing syndrome scale score from the child behavior checklist or CBCL (Achenbach, 1991) and using the oppositional defiant disorder subscale score of the disruptive behavior disorder scale or DBD (Barkley, 1996). Both are valid and reliable instruments that capture individual differences in children’s aggression and conduct problems (e.g., published alpha coefficients in the .7 to .8 range). The Externalizing Syndrome subscale (e.g., aggression, conduct problems) from CBCL included 33 items rated on a 3-point scale (0 = not true, 1 = somewhat or sometimes true, 2 = very true or often true) and they were averaged to create a single Externalizing

Syndrome score. The Oppositional-Defiant Disorder subscale (e.g., noncompliance, conduct problems) included 8 items rated on a 4-point scale (0 = not at all to 4 = very much) and they were averaged to create a single Oppositional Defiant Disorder score. The current study dataset had inter-rater (mother-father) and test-retest reliability data for both scores. The Externalizing and Oppositional-Defiant scores were stable over time ( $r = .52$  to  $.79$ ), and mother-father agreement was moderate to substantial ( $r = .39$  to  $.62$ ); see Deater-Deckard et al., 2009. Because the CBCL and DBD scores were highly correlated ( $r = .75$ ), they were standardized and averaged to yield a single behavior problem composite score, and then it was standardized again.

**Child effortful control measures.** Mothers completed the validated and reliable Child Behavior Questionnaire Short Form to rate the three dimensions of child temperament (CBQ-SF, Putnam & Rothbart, 2006). The questionnaire has 94 items in total, which fall into three broad dimensions (effortful control, negative affect, and surgency) and 15 subscales (in the current dataset, internal consistency ranged from  $\alpha = .60$  to  $.87$  depending on subscale and twin; Mullineaux et al., 2009). The effortful control scale is the average of attention focusing, inhibitory control, perceptual sensitivity, and low-intensity pleasure subscale scores. The questionnaire used a 7-point Likert scale ranging from “extremely true” to “extremely untrue” for the child. The Effortful Control scale included 26 items, such as, “Can wait before entering into new activities if s/he is asked to.”, “Is good at following instructions.”, “When building or putting something together, becomes very involved in what s/he is doing, and works for long periods.” Inter-rater (mother-father) reliability for Effortful Control ranged from  $.60$  to  $.62$  depending on the twin (Mullineaux et al., 2009).

## CHAPTER 3

### RESULTS

Descriptive statistics and bivariate correlations were computed. All variables showed some skewness (i.e., skewness statistics values from  $\pm 0.28$  to 1.50). Bivariate correlations between child effortful control, harsh parenting, and child conduct problems showed that in general there was covariation between lower child effortful control, higher harsh parenting, and higher conduct problems in twin 1 as well as twin 2 (Table1).

We computed relative and absolute difference scores for key variables (twin 1 score – twin 2 score). For the difference scores of each statistical predictor (e.g., differential harsh parenting, sibling differences in child effortful control) and the outcome variable (e.g., sibling differences in conduct problems), descriptive statistics and bivariate correlations were computed. These are reported in Table2; absolute and relative difference score data are presented separately. All variables showed some skewness (i.e., skewness statistics values from  $\pm .63$  to 1.80). Bivariate correlations between sibling differences in effortful control, sibling differences in harsh parenting exposure, and sibling differences in conduct problems showed that greater sibling differences in harsh parenting exposure on the PFQ were correlated with greater sibling differences in conduct problems, as well as with greater sibling differences in effortful control. Greater sibling differences in harsh parenting exposure on the PARCHISY were correlated with greater sibling differences in conduct problems. However, there was no significant association between sibling differences in effortful control and sibling differences in conduct problems.

Turning to hypothesis testing, we standardized all relative difference scores and

then used multiple standard regression analyses to estimate the additive and interactive effects of statistical predictors (e.g., sibling differences in maternal harsh parenting exposure and sibling differences in effortful control) of sibling differences in conduct problems. Two sets of equations were estimated: one standard regression using the self-reported (PFQ) harsh parenting predictor, and a second standard regression using the observer-rated (PARCHISY) harsh parenting predictor. Next, we examined statistical “child effects” and two sets of equations were estimated: a third standard regression using self-reported (PFQ) harsh parenting as the outcome variable, and a fourth standard regression using observer-rated (PARCHISY) harsh parenting for the outcome variable.

Results are shown in Table 2. We began with the self-reported PFQ scores. Regarding the first hypothesis, greater sibling differences in conduct problems were predicted by greater differences in harsh parenting exposure between siblings (PFQ), but not by differences in effortful control. The child who received harsher parenting had higher levels of conduct problems, compared to the sibling. Regarding the second hypothesis, the expected two-way interaction between sibling differences in harsh parenting (PFQ) and differences in effortful control was not significant.

Turning to analysis of the observer-rated PARCHISY scores, results were consistent with the results using the PFQ. Within families, greater sibling differences in conduct problems were predicted by greater differences in harsh parenting exposure between siblings (PARCHISY), but not by differences in effortful control. The expected two-way interaction was not significant.

Next, we examined statistical bidirectional “child effects”. Sibling differences in the levels of conduct problems were examined as a statistical predictor of differential



harsh parenting exposure as the outcome variable. Results are shown in Table 3; again, we began with the parent self-reported harsh parenting (PFQ). Within families, greater sibling differences in harsh parenting exposure (PFQ) were predicted by greater sibling differences in conduct problems and greater sibling differences in effortful control, such that the child who showed higher levels of conduct problems and had lower effortful control also was receiving harsher parenting compared to the sibling. The expected two-way interaction between sibling differences in conduct problems and differences in effortful control was not significant.

Turning to the observer-rated PARCHISY data, greater sibling differences in harsh parenting exposure were predicted by greater sibling differences in conduct problems, but not by differences in effortful control. The child who showed higher levels of conduct problems also received harsher parenting than the sibling. The expected two-way interaction again was not significant.

In a follow-up analysis, to explore whether there were any differences in results when the smaller subset of monozygotic (MZ) twin pairs was removed from the analyses, I conducted the same standard regressions again by only including dizygotic (DZ) twins. The results did not change.

## CHAPTER 4

### DISCUSSION

The current study adds to extant findings and theory regarding child conduct problems in middle childhood by testing hypotheses about the interplay of differential harsh parenting and sibling differences in child effortful control in the prediction of sibling differences in child conduct problems. The major gap in this literature is that nearly all the related prior studies have used a between-family design to examine the potential moderation effect of child effortful control on child conduct problems. The current study addresses this gap by using a within-family design to examine the sibling differences in conduct problems in middle childhood (at about 8 years of age). To our knowledge, no prior studies have used a within-family design to examine the associations between differential parenting and sibling differences in conduct problems in the levels of sibling differences in effortful control.

Consistent with hypothesis H1, sibling differences in the levels of conduct problems were predicted by sibling differences in harsh parenting exposure, such that the sibling who received harsher parenting also had higher levels of conduct problems than her or his sibling. The findings for H1 with regard to “main effects of sibling differences in harsh parenting” align with previous studies comparing children between families, whereby harsh parenting is theorized to operate as an environmental risk factor for child conduct problems (Baumrind, 1993; Mackenzie et al., 2014; Odgers et al., 2008; Patterson et al., 1992; Scaramella & Leve, 2004; Shaw et al., 2003; Smith et al., 2014; Waller et al., 2012). Parents’ use of psychologically or physically harsh parenting discipline supports the child learning to become more aggressive and angry, which in turn causes child conduct problems, aggression, and other antisocial behaviors

(Baumrind, 1993; Dodge et al., 1990; Flouri et al., 2017; Gershoff, 2002; Patterson et al., 1992; Zubizarreta et al., 2019). Since parents play a key role in modeling emotion and behavior in children's development, children who have been exposed to harsh and coercive parenting are more likely to learn disruptive and aggressive approaches to social relationships through modeling and reinforcement, which ultimately influences the development and persistence of conduct problems and other behavioral problems (Dishion & Snyder, 2016; Patterson et al., 1992; Zubizarreta et al., 2019).

However, unexpectedly, no associations between sibling differences in effortful control and sibling differences in conduct problems were found. Previous studies of between-family child differences have found that effortful control predicts conduct problems (e.g., Chang et al., 2011; Chen et al., 2014; Eisenberg et al., 2009; Frick & Morris, 2004; Karreman et al., 2009; Kochanska et al., 2003; Lengua, Honorado, & Bush, 2007; Lengua, 2008; Zhou et al., 2007). In the current study, there were no significant associations between sibling differences in effortful control and sibling differences in conduct problems when utilizing a within-family sibling design. Thus, sibling differences in effortful control abilities may not play a role in sibling differences in conduct problems in middle childhood.

Regarding hypothesis H2 in which the potential moderating role of effortful control was tested, results showed that sibling differences in effortful control did not moderate the link between sibling differences in harsh parenting exposure and sibling differences in conduct problems. This result was not consistent with some of the previous research that has shown that harsh caregiving interacts with effortful control by augmenting subsequent child conduct problems for those children with low levels of effortful control (Belsky et al., 1998; Chen et al., 2014; Edwards et al., 2015;

Gartstein et al., 2003; Lengua, 2006; Morris et al., 2002; Zubizarreta et al., 2019). However, this null finding was consistent with other previous studies that reported no significant interaction effect between parental negative parenting and child effortful control in the prediction of child behavior problems (Garstein et al., 2003; Karreman et al., 2009; Olson et al., 2005). Again, it is important to note that prior studies used between-family designs. Since our study utilized a within-family design, it had lower statistical power to detect interaction effects compared to the main effects and it was more complicated and therefore harder to detect effects and replicate them.

Regarding hypothesis H3 in which potential “child effects” were tested, we reversed the direction of statistical predictions. The results showed that differential harsh parenting exposure based on mothers’ perceptions (i.e., PFQ questionnaire) was statistically predicted by greater sibling differences in conduct problems and greater sibling differences in effortful control. Specifically, the sibling who showed a higher level of conduct problems and who had a lower level of effortful control also received higher harsh parenting compared to her or his sibling. However, results were slightly different for observers’ ratings of parenting (i.e., PARCHISY coding system). Sibling differences in observed harsh parenting were statistically predicted by sibling differences in conduct problems but not effortful control; the sibling who was rated as being higher in conduct problems also received harsher parenting than her or his sibling.

In general, the findings align with previous between-family studies in that the child who exhibited more behavior problems elicited harsher parenting from parents (Frick et al., 2003), and children’s poorer effortful control predicted later poor parental discipline (e.g., harsh and inconsistent discipline) (Tiberio et al., 2016). Harsh and controlling parenting involving verbal hostility and physical punishment has been

shown to be associated with lower levels of effortful control from toddlerhood to middle childhood (Dishion & Patterson, 2006; Eisenberg et al., 2011; Kochanska, Aksan, Prisco, and Adams, 2008; Olson et al., 2005; Tiberio et al., 2016; Zhou, Eisenberg, Wang and Reiser, 2004). Parents have more difficulty interacting with, teaching, and managing a child who is less skilled in controlling their own emotions and behaviors (Tiberio et al., 2016). In the current study, the siblings' different characteristics (e.g., conduct problems and effortful control) also may be evoking differential levels of parental harshness, with the parent responding more harshly toward the sibling child who manifests higher levels of conduct problems and lower levels of effortful control, compared to a sibling. The prior between-family study evidence, and the current within-family study evidence, align with theories that emphasize children's traits eliciting different reactions from their parents (Crouter et al., 1999; Frick et al., 2003; Jeannin et al., 2015; Scarr & McCartney, 1983; Solmeyer et al., 2012); according to this view, children are not just passive recipients of environmental influences, but they play an active role in their relationships with their parents. Parents perceive and interpret the sibling differences in temperament and other attributes between their children, and these perceived differences have been shown to be the main predictor of differential parental treatment (Lam et al., 2012; McHale & Counter, 2003).

Regarding hypothesis H4 in which the potential moderation effect of effortful control was tested (this time, with regard to "child effects"), sibling differences in effortful control did not moderate the link between sibling differences in conduct problems and sibling differences in harsh parenting exposure. To my knowledge, no studies have yet examined whether children's temperament and conduct problems interactively predict harsh parenting. Thus, contrary to the expected interaction effect, there was no evidence to indicate that the link between conduct problems and harsh

parenting would depend on the level of child effortful control.

### **Strengths, Limitations and Conclusions**

One of the strengths using a same-sex twin design in the current study is that we could control for potential effects of child gender and age in a within-family design. In the non-twin sibling design as well as between-family design, children are usually different ages and genders. That heterogeneity was controlled within families, in the study design.

Second, we used multiple informants to acquire information about key constructs, which allowed us to identify potential method and informant differences. Observers assessed the mothers' harsh parenting, and mothers also reported on their parenting behavior and their child's temperament. Thus, we were able to examine whether it is valid to interpret findings as generalizable across informants.

Third, the within-family design also controls for variations in family circumstances and environmental heterogeneity (because the siblings are growing up together in the same household); this permits isolation of any statistical effects due to salient differences in individual development between children within the same family.

There also are limitations that should be considered when interpreting the results. First, twin pregnancies can have distinct features compared to singleton pregnancies, and twin births are relatively rare compared to singleton births (about 33 births per 1,000, <https://www.cdc.gov/nchs/fastats/multiple.htm>). Second, about 40% of our sample was genetically identical twins. Taken together, these features of the sample mean the results may not generalize to non-twin siblings, or to singleton children more broadly. Future research should utilize non-twin siblings to replicate and

extend our findings. Third, most of the participants were Caucasian (90%). Exploring the role of temperament on the association between harsh parenting exposure and child conduct problems in a more diverse sample is necessary to generalize to a broader population. Fourth, the cross-sectional correlational design does not permit inferences of causality. Future research should consider including longitudinal data to test whether patterns persist or showed cross-lagged effects (e.g., child behavior predicting changes in parenting; parenting behavior predicting changes in child behavior) over time. Finally, a family systems perspective requires inclusion of all family relationships, but we examined only the mother-child dyad. The father-child relationship also should be examined, to better understand the effects of differential parenting behavior on child conduct problems. The fathers' parenting might play a distinct role compared to the mothers' parenting (Lee, Pace, Lee, & Knauer, 2018; Park et al., 2018). Furthermore, sibling relationships (e.g., closeness, conflict) also should be investigated, to understand how the sibling relationship will strengthen or weaken the effects of parenting on child developmental outcomes (Kumador, Tackie-Ofosu, & Mahama, 2018; Pike & Oliver, 2017). Exploring the role of father and sibling relationship in the association between harsh parenting and child conduct problems is necessary to better understand family systems holistically.

In conclusion, there are many theories about socialization, parent-child effects, and the development of typical and maladaptive behavior. However, almost all of the existing research is based on one child per family and examines variation between families only. That might explain, in part, why previous studies have found inconsistent results on the moderating effects of child temperament on the association between parenting and child behavioral outcomes. When researchers examine two or more children within each family, there are reliable and sometimes substantial

differences between children (in their characteristics, as well as the experiences they are having in the same home), that is ignored in between-family studies. Researchers need to pay attention to within-family variations, to better understand proximal family processes. The current study presented evidence of differential harsh parenting, and sibling differences in conduct problems that can be both a consequence and cause of each other (i.e., bidirectionality). Studies of within-family differential parenting also are essential, for informing prevention and intervention efforts. Parents and families can benefit when informed about how their differential parenting practices affect each child's development and functioning.



Table 1.

## Correlations and Descriptive Statistics for Twin 1 and Twin 2

Variables (Twin1)	1	2	3	4
1. Twin1 effortful control	1.00			
2. Twin1 harsh parenting exposure [self-report, PFQ]	-.22**	1.00		
3. Twin1 harsh parenting exposure [observer-report, PARCHISY]	-.13	.09	1.00	
4. Twin1 conduct problems (z)	-.31**	.62**	.16*	1.00
<i>M</i>	.537	29.02	1.18	.00
<i>SD</i>	.58	11.10	.32	.94

\*  $p < .05$ , \*\*  $p < .01$  (all two-tailed tests)

Variables (Twin2)	1	2	3	4
1. Twin2 effortful control	1.00			
2. Twin2 harsh parenting exposure [self-report, PFQ]	-.25**	1.00		
3. Twin2 harsh parenting exposure [observer-report, PARCHISY]	.12	.26**	1.00	
4. Twin2 conduct problems (z)	-.23**	.63**	.37*	1.00
<i>M</i>	5.30	27.92	1.20	.00
<i>SD</i>	.66	11.41	.35	.96

\*  $p < .05$ , \*\*  $p < .01$  (all two-tailed tests)

Table 2. Correlations and Descriptive Statistics for Relative Difference Score and Absolute Difference Score

Variables (Relative difference scores)	1	2	3	4
1. Sibling differences in effortful control	1.00			
2. Differences in harsh parenting exposure [self-report, PFQ]	-.30**	1.00		
3. Differences in harsh parenting exposure [observer-report, PARCHISY]	-.08	.22**	1.00	
4. Sibling differences in conduct problems	-.10	.63**	.17*	1.00
<i>M</i>	.07	1.16	-.02	.01
<i>SD</i>	.58	9.03	.43	.83

\*  $p < .05$ , \*\*  $p < .01$  (all two-tailed tests)

Variables (Absolute difference scores)	1	2	3	4
1. Sibling differences in effortful control	1.00			
2. Differences in harsh parenting exposure [self-report, PFQ]	.26**	1.00		
3. Differences in harsh parenting exposure [observer-report, PARCHISY]	-.01	.10	1.00	
4. Sibling differences in conduct problems	.15	.45**	.17*	1.00
<i>M</i>	.42	6.01	.26	.56
<i>SD</i>	.40	6.83	.35	.61

\*  $p < .05$ , \*\*  $p < .01$  (all two-tailed tests)

Table 3. Differential Harsh Parenting Regression Predicting Sibling Differences in Conduct Problems

<b>Sibling Differences in Conduct Problems</b>	<i>B</i>	<i>S.E</i>	$\beta$	<i>t</i>	<i>p</i>
F (3, 171) = 32.67, $p < .001$ , $R^2 = .36$					
Differences in harsh parenting exposure [PFQ] ( <i>z</i> )	.51	.05	.63	9.66	.000
Sibling differences in effortful control ( <i>z</i> )	.07	.05	.09	1.43	.154
Differential harsh parenting X Sibling differences in effortful control	-.003	.03	-.01	-.10	.922

  

<b>Sibling Differences in Conduct Problems</b>	<i>B</i>	<i>S.E</i>	$\beta$	<i>t</i>	<i>p</i>
F (3, 171) = 32.67, $p < .001$ , $R^2 = .36$					
Differences in harsh parenting exposure [PARCHISY] ( <i>z</i> )	.16	.07	.20	2.42	.017
Sibling differences in effortful control ( <i>z</i> )	-.10	.06	-.13	-1.51	.133
Differential Harsh parenting X Sibling differences in effortful control	.00	.07	-.001	-.01	.994

Notes. *z* = variable standardized

Table 4. Sibling Differences in Conduct Problems Regression Predicting Differential Harsh Parenting

<b>Differential Harsh Parenting [PFQ]</b>	<i>B</i>	<i>S.E</i>	$\beta$	<i>t</i>	<i>p</i>
F (3, 171) = 40.53, <i>p</i> < .001, <i>R</i> <sup>2</sup> = .42					
Sibling differences in conduct problems ( <i>z</i> )	5.27	.55	.57	9.67	.000
Sibling differences in effortful control ( <i>z</i> )	-2.11	.53	-.24	-3.97	.000
Sibling differences in conduct problems X effortful control	.15	.47	.02	.32	.749

  

<b>Differential Harsh Parenting [PARCHISY]</b>	<i>B</i>	<i>S.E</i>	$\beta$	<i>t</i>	<i>p</i>
F (3, 140) = 2.29, <i>p</i> = .08, <i>R</i> <sup>2</sup> = .05					
Sibling differences in conduct problems ( <i>z</i> )	.09	.04	.21	2.43	.016
Sibling differences in effortful control ( <i>z</i> )	.04	.04	.09	1.05	.295
Sibling differences in conduct problems X effortful control	-.01	.03	-.02	-.26	.793

*Notes.* *z* = variable standardized

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