

THE IMPACT OF CHILD'S INHIBITORY CONTROL ON MARITAL
SATISFACTION AND COPARENTING

by

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A DISSERTATION

Presented to the Department of Special Education and Clinical Sciences and the Graduate
School of the University of Oregon
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy

June 2020

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DISSERTATION ABSTRACT

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Doctor of Philosophy

Department of Special Education and Clinical Sciences

June 2020

Title: The Impact of Child's Inhibitory Control on Marital Satisfaction and Coparenting

A child's ability to cope with emotional and stressful situations relies on the development of inhibitory regulation systems. Research shows that there is a possible association between child characteristics, in particular higher-level executive functioning, and the marital subsystem. Additionally, research has indicated that couples with less marital satisfaction have less supportive coparenting behavior. While some literature has addressed the effects of a child's cognitive functioning on marital satisfaction and the couple's relationship dynamics, less is known about how children's inhibitory control in particular affect the parents' marital relationship in preschool-aged children.

Furthermore, few of these studies have included both parent-reported and observed measures of children's inhibitory control.

The present study examined the relations among child's inhibitory control, marital adjustment, and coparenting. These associations were assessed within a sample of 76 biological mothers who are cohabiting with their partners as well as their 3 to 5-year-old preschool-aged children. Multiple regression analyses were conducted to determine if observed and reported child inhibitory control predicted maternal reports of marital adjustment. Additionally, the extent to which coparenting mediates the relation between child's inhibitory control and marital satisfaction was investigated. Results indicated that

although there is a significant association between coparenting and child's inhibitory control, there is no association between child's inhibitory control and marital satisfaction. The significance and limitations of these findings are discussed, as well as recommendations for future research.

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ACKNOWLEDGMENTS

I would like to express my gratitude to my advisor, Laura Lee McIntyre, for her guidance throughout the development and completion of this dissertation as well as my graduate training. Her constant support, encouragement, and advice over the past several years has been invaluable. I also wish to express my sincerest appreciation to my secondary advisor, Nicole Giuliani, for her time and input in preparing and developing this dissertation. She was an instrumental part in the course of my dissertation work. Finally, I would like to thank Wendy Machalicek and Jeffrey Todahl for serving as valuable members on my committee. This research was supported by an early career award by the Society for The Study of School Psychology awarded to Nicole Giuliani at the University of Oregon.

For my parents and grandmother for teaching me independence, resilience, and love
For my sister for being my emotional anchor my entire life
For my husband for his patience, sensibility, humor, and unwavering encouragement
For my friends for their kindness, devotion, and endless support

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CHAPTER I

INTRODUCTION

Child's Inhibitory Control

Executive functioning is a psychological construct encompassing a set of higher-order cognitive processes that are necessary for selecting and controlling one's thoughts, behaviors, and actions (Carlson, 2005). These higher-order processes include working memory, inhibitory control, cognitive flexibility, prioritizing, and behavioral organization (Carlson, 2005). Inhibitory control is a central component of executive function and a salient component of self-regulation and cognitive abilities that is commonly separated into two main components of response inhibition and interference control (Liu, Zhu, Ziegler, & Shi, 2015). Inhibitory control generally focuses on the ability to engage in ongoing information processing, actively inhibiting automatic response and delaying response to achieve a goal (Carlson, 2005). In other words, inhibitory control is referred to one's ability to focus on relevant stimuli in the presence of irrelevant stimuli (Lewis, Reeve, Kelly, & Johnson, 2017).

Gaining the ability to regulate one's own emotions and behavior during early childhood is an important developmental milestone. Despite that, there is a limited understanding of the developmental trajectory of inhibition through childhood (Lewis et al., 2017). Generally, research shows that inhibitory control begins to emerge by the end of the first postnatal year and develop quickly across the toddler period and into the preschool years (Cuevas et al., 2014; Wolfe & Bell, 2007). Individual differences in the manifestation of inhibitory control is an important factor in how parents perceive their children's functioning. As children transition through different developmental milestones, parents change their expectations

of how their children should regulate their behavior according to the external demands presented to them (Kochanska, Murray, & Coy, 1997).

Inhibitory control is critically important in the overall neuropsychological functioning of the developing child and plays a fundamental role in the child's cognitive, behavioral, social-emotional development (Sasser, Bierman, & Heinrichs, 2015; Willoughby, Kupersmidt, Voegler-Lee, & Bryant, 2011) as well as adaptive functioning and self-regulation (Dowsett & Livesey, 2000). Children's ability to deal with novel, emotional, stressful situations heavily relies on the development of inhibitory regulation systems, which provide children with new ways to cope with stressors and other stimuli (Smith-Donald et al., 2007). In particular, amongst preschool age children, individual differences in inhibitory control have been associated with developmental improvements in socialization, self-regulatory functions, emotional responses, school achievement in math and reading, and overall school readiness (Diamond, Barnett, Thomas, & Munroe, 2007; Moffitt et al., 2011). Through enhancing processes that underlie attentional and behavioral regulation, inhibitory control fosters children's school readiness and long-term academic success (Ursache, Blair, & Raver, 2012). The levels of self-regulation that children manifest in the early school years meaningfully predicts their current and future academic and socioemotional achievement (Ursache, Blair, & Raver, 2012).

Literature has demonstrated the intergenerational transmission of overall self-regulation (e.g., Boutwell & Beaver, 2010; Cuevas et al., 2014; Deater-Deckard, 2014). Parents and children show significant coherence of self-regulation and related constructs, such as inhibitory control and emotional regulation (Cuevas et al., 2014). Research suggests that this relationship is a combination of biological and environmental factors. On one hand, neural bases of parents' self-regulation are inherited by children, and on the other hand, parents teach and model self-

regulation to their children (Deater-Deckard, 2014). According to developmental systems theory, caregivers are the main source for children in learning this complex higher-order process and providing extrinsic regulatory influences from the very early on (Thompson, 2011). Parental efforts to support a young child's attempts at autonomy contribute to the development of appropriate self-regulation behavior and inhibitory control (Fox & Calkins, 2003). Although parents' contribution and impact on the development of child's inhibitory control has been investigated, there is still little known about the bidirectionality of this association and how children's inhibitory control impacts parents' self-regulation and interpersonal relationships.

Marital Satisfaction

The marital relationship entails emotions, behaviors, and attitudes toward a romantic partner. Family systems theory highlights the notion that studying family transitions, such as transition to parenthood, are critical to understanding adjustment (Cox & Paley, 2003). Based on this theory, alteration in one aspect of a family system requires that the entire system adjust and rearrange. As a couple embarks on this transition, they must adapt and redefine themselves to meet the needs of their new role as parents (Cowan & Cowan, 2000). They naturally have less time to spend on couple-oriented leisure activities with their partners because they must devote more energy and effort on childcare and household related labor (MacDermid et al., 1990). For all these reasons, marital satisfaction tends to decrease after the transition to parenthood, whereas marital conflict increases (Mitnick et al., 2009).

Family system theory posits that families are organized systems, and to understand the functioning of one subsystem it is necessary to examine the functioning of other subsystems. As such, several studies have investigated the bidirectionality of the marital relationship and the child's characteristics. Baker et al. (2005) showed that at present and cumulative child

behavioral problems are linked to depression as well as poorer marital adjustment among mothers. According to a transactive model proposed by Crockenberg, Leerker, and Lekka (2007), there is a possible association between child characteristics and the marital subsystem. They suggest that parents with poorer quality marital relationships may be more susceptible to the negative impact of the child's characteristics, such as temperament and self-regulation skills.

Children with low inhibitory control are more likely to exhibit difficulties with following directions and display higher levels of externalizing behaviors (Kochanska & Knaack, 2003; Pluess & Belksy, 2009), which may make parenting harder, and thus put a strain on the marital quality. Additionally, a child's inhibitory control may act as a regulatory feature of temperament, which then can influence the way a parent responds to the child's needs. Moreover, child temperament has been found to mediate the relationships between the power of parenting support and child's development inhibitory control (Conway & Stifter, 2012).

Although research has documented the significant impact of children on marital adjustment, the role of the child's inhibitory control has not yet been fully examined. As such, it is important to investigate the mechanisms underlying the relation between child inhibitory control and marital adjustment to better understand and build additional support for practitioners to intervene on this relationship to potentially prevent the occurrence of negative family outcomes (e.g., poor marital quality).

Coparenting

Distinct from dyadic marital interactions, coparenting encompasses the whole family. Coparenting is theorized to occur at a triadic, or whole-family, level of analysis within the family system, and it is considered to be simultaneously related and yet distinct from marital interaction, which exist at a dyadic level (Hayden et al., 1998). Coparenting is defined as the quality of

coordination and dynamic between couples within a family who work together as parents to raise a child and share childcare responsibilities (Feinberg, 2003; Schoppe-Sullivan, Mangelsdorf, Frosch, & McHale, 2004). Coparenting is a construct that embodies parents' efforts to assist, encourage, and complement each other's parenting as well as their efforts to undermine, criticize, and interrupt each other's parenting in the child's presence (McHale, Kuersten-Hogan, & Lauretti, 1996). Coparenting has been identified as an essential process for partners working together to socialize, care for, and raise a child.

Minuchin's (1974) family systems theory stresses the importance of coparenting and view it as a family's executive subsystem and consider it vital to the emotional lives of children. A large body of research suggests significant impact of coparenting style on children's emotional regulation and adjustment (Grych & Fincham, 2001; McHale, Johnson, & Sinclair, 1999; McHale & Rasmussen, 1998). In order for children's behaviors and functions to be systematically understood, it is essential to take into consideration the network of relationships in which they are embedded and their family dynamics (Schoppe-Sullivan et al., 2004). Research suggests that, in order to determine how coparenting styles contribute to children's behavioral issues and emotional dysregulation, it is necessary to examine both positive and negative aspects of coparenting (i.e., cooperative and competitive coparenting). Cooperative coparenting is viewed as the partner's efforts to assist and complement the other's parenting activities and responsibilities (McHale, 1995). Cooperative parents provide ongoing support and encouragements to each other's parenting and work together as a team. In contrast, competitive coparenting is characterized by undermining or intruding on the other parent's interactions with the child, competing with one another for the child's attention and having a lower level of collaboration and responsiveness between partners (McHale, Kuersten-Hogan, & Lauretti, 1996).

Parents may compete with each other when providing instructions and setting limits for their child and/or criticize their partner's parenting in the child's presence.

Previous studies have found that cooperative coparenting is primarily associated with children's positive outcomes unlike competitive coparenting, which is significantly associated with negative child outcomes (Baril, Crouter, & McHale, 2007; McHale, Rao, & Krasnow, 2000). Specifically, competitive coparenting is linked with externalizing behavior among preschool and school-age children and risky, defiant and antisocial behaviors during adolescence (McHale, Rao, & Krasnow, 2000). As children rely on their parents for security, safety, and stability in both the long- and short-term, competitive coparenting prevents children from depending on their parents as a source of emotional security (Cummings, Schermerhorn, Davies, Goeke-Morey, & Cummings, 2006). Moreover, parents are the first and most influential role models for their children; thus, exposing them to competitive coparenting results in children internalizing competitive interactional patterns and exhibiting similar behaviors during their interactions with others (Kochanska, Barry, Aksan, & Boldt, 2008).

Parents who mutually undermine and challenge each other during competitive coparenting, create dysfunctional, unsystematic, ineffective, and chaotic family structures and environments (Umemura, Christopher, Mann, Jacobvitz, & Hazen, 2015). Subsequently, competitive coparenting diminishes compliance, respect, and support in triadic interaction (Umemura et al., 2015). Research findings suggest a direct association between marital dynamics and coparenting and have proposed several hypotheses linking coparenting and marriage. Belsky, Crnic, and Gable (1995) found that parents who had greater within-couple differences on their individual characteristics showed a less supportive coparenting than did couples who were more similar. They suggested that differences between couples on individual characteristics

created strain that affected their coparenting relationship. In another study by Kitmann, Gaylord, Holt, and Kenny (2000), the authors found that fathers displayed less cooperative coparenting styles after an argument with their spouses. Authors explained the outcome using spillover hypothesis by which the negative affect experienced in marital conflict first spills into the coparenting relationship and then into parenting interactions with children. Likewise, the findings of Gable, Reis, and Downey (2003) suggested that lower levels of supportive coparenting may result in spouses believing that their partners do not have confidence in their parenting competencies, which in turn may result in lower marital quality. Similarly, the findings of Schoppe-Sullivan, Mangelsdorf, Brown, and Sokolowski (2007) showed that less supportive coparenting is associated with lower levels of marital satisfaction among parents of young typically developing children. Comparably, Belsky and Hsieh (1998) study showed that higher initial levels of unsupportive coparenting was associated with deteriorating marriage over time.

With respect to child characteristics, there is some evidence supporting an association among child's characteristics, coparenting, and quality of the marital relationship. For instance, Schoppe-Sullivan et al., (2007) observed that, within families that reported low marital quality, having an adaptable infant increased coparents' undermining behaviors. In another study by Burney and Leerkes (2010), fathers were more likely to exhibit more competitive coparenting when they reported low quality marital relationships and identified their child as highly reactive with low inhibitory control. Similarly, Cook, Schoppe-Sullivan, Buckley, & Davis (2009) found that preschoolers' lack of self-regulation was associated with less supportive coparenting only when marital dissatisfaction was high. Although these findings allude to potential interaction between child's characteristic, marital relationship quality and coparenting behavior, the coparenting literature has also found some evidence rejecting the notion of child effects. For

instance, in their study of preschool children, Straight and Bales (2003) found that children's age, gender, and temperament were not associated with the level of observed coparenting.

Overall, the role of higher cognitive functioning, in particular inhibitory control among preschool age children, is yet to be thoroughly explored. It is important for future research to investigate coparenting to further the understanding of how children's inhibitory control abilities and their parents' marital relationship contribute to the differences in coparenting behavior. Family-centered interventions that focus on both child impact and marital satisfaction (in the context of coparenting) may be useful approaches for promoting optimal outcomes in preschool-aged children. Moreover, these findings may have implications for future interventions to focus on child behavioral management in addition to parenting strategies.

Purpose of the Study

Although there has been an increase in research studies on the association between coparenting and marital adjustment, the nature of the associations remains unclear (Margolin et al., 2001). This may be due to the fact that few studies have focused explicitly on understanding the associations between coparenting and marital relationships in relation to child's self-regulation characteristics. Additionally, research on coparenting has primarily focused on investigating coparenting direct and additive effects on children and marital satisfaction and to date has not considered coparenting's role as a mechanism. Thus, the primary goal of the present study was to advance the literature on coparenting by examining its mediating role in the relation between the child's inhibitory control and marital adjustment. There is still a need for further studies investigating this association in order to formulate preventive or psychoeducational interventions with expectant parents or young families focused on helping parents establish and maintain successful coparenting relationships as their children grow.

The purpose of current study was to further clarify the nature of the links between coparenting and marital behavioral within this important developmental phase during which many couples report a decrease in marital satisfaction and increase in marital conflict (Cowan & Cowan, 1988). In their study, Blandon et al. (2014) found notable variation across contexts in coparenting suggesting that parents may alter how they interact with each other in response to their child's developmental and situational demands. Therefore, the current study exclusively concentrated on children's inhibitory control, a regulatory dimension of temperament, that is fairly stable by 3 and a half years of age (Kochanska & Knaack, 2003). During this developmental stage, coparenting challenges are more likely based on couples' consistency in relation to their directives and discipline to the child (Schoppe-Sullivan et al., 2004) which may be vastly different based on child's self-regulation and age. Additionally, preschool children with low inhibitory control are more likely to have difficulty sitting still, and following directions, and display greater externalizing behaviors (Kochanska & Knaack, 2003), which can put a strain on the coparenting relationship.

Research Questions

The present study analyzed data from the Parent- Child Self-Regulation Study (PCSR). The current study addressed the following research questions and proposed the following hypotheses based on the previously reviewed literature:

(1) What are the relations between children's inhibitory control and marital satisfaction?

The goal of this question was to build upon and extend findings indicating that a relation exists between the marital domain and children's self-regulation. The marital domain can be viewed as encompassing both marital quality and spousal support around child rearing. Given the importance of early intervention, family influences are important to examine for understanding

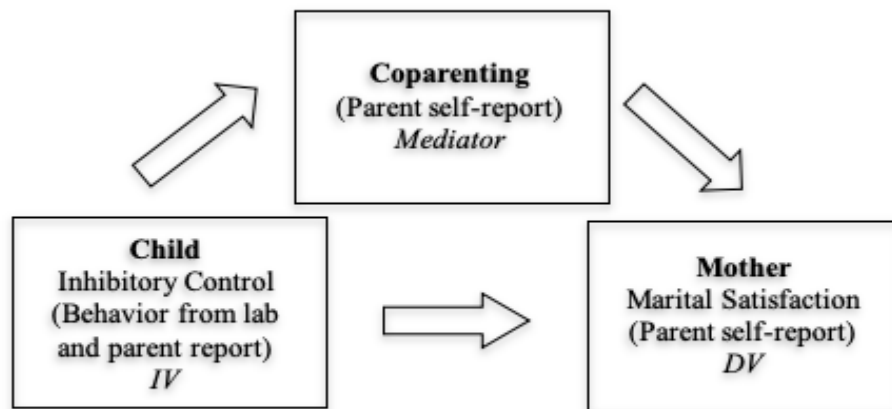
the onset and maintenance of such difficulties. Thus, a fundamental goal of this study was to examine whether there was an association between preschool aged children's inhibitory control and parents' marital quality and satisfaction. It was hypothesized that lower level of child's inhibitory control would be associated with lower level of marital satisfaction in a sample of families with preschool aged children. As a part of this question, the potential impact of demographic variables was also evaluated. In particular, differences were investigated in inhibitory control and marital satisfaction by demographic variables such as child's age, household income, and maternal years of education.

(2) Does coparenting mediate relations between child's inhibitory control and marital satisfaction?

Research has established the uniqueness of coparenting and its potential to influence children's socioemotional adjustment, above and beyond marital quality or dyadic parenting (Karreman, van Tuijl, van Aken, & Dekovic', 2008; McHale & Rasmussen, 1998). Additionally, recent research suggests that the coparenting relationship is a malleable variable (Bullard et al., 2010). In particular, Feinberg (2003) suggest that coparenting might be especially susceptible because some of the child's difficult characteristics may result in failures of particular parenting strategies leading to greater undermining behavior between parents. During this developmental phase, children increase their independence and noncompliance despite their limited ability to regulate their behaviors and emotions. This may trigger new challenges for some parents. As such, this study aimed to investigate whether or not the association between a child's inhibitory control and their parents' marital relationship quality was explained by parent report of variances in coparenting behavior during parent's interaction with preschoolers. It was hypothesized that coparenting would at least partially mediate the relationship between child's inhibitory control

and marital satisfaction in mothers of preschool children. Figure 1 presents the overall conceptual model of the proposed study.

Figure 1. Conceptual Model of Proposed Study



Independent Variable

The continuous independent variable (IV) was the child's inhibitory control. It is important to note that there are multiple approaches to studying the inhibitory control in children and that there is no universal measure of inhibitory control as of yet (Carlson, 2005). Two of the most common approaches in early development field are known as observed behavioral expression of inhibitory control on laboratory-based tasks, as well as parent reported measures of inhibitory development. For the purpose of this study, children's inhibitory control was measured in both ways and used as separate independent variables.

Dependent Variable

The continuous dependent variable (DV) was mother's marital satisfaction. Additionally, in the second research question, the continuous variable of coparenting was examined as a quantitative mediator variable.

CHAPTER II METHODOLOGY

Participants

The present study analyzed previously collected data from the Parent Child Self-Regulation (PCSR). Participants were 76 preschool-age children and their biological mother who served as participants in PCSR study conducted at the University of Oregon ($N = 88$; Giuliani, PI) investigating the parental influence on self-regulation in preschoolers. Dyads consisted of biological mothers aged 18 years or older and children 3-5 years old. All primary caregivers lived with a partner at home at the time of data collection.

Procedure

Before any assessments took place, mothers provided informed consent. Once consent was provided, a link to a Qualtrics survey was sent to the mothers giving them access to the questionnaires. Mothers and preschool-aged children came to the Prevention Science Institute (PSI), where they were oriented to the assessment space at the Child and Family Center (CFC). Children were invited to stay with their mother, play with the toys in the room, or watch a provided video approved by the mother. It was required for mothers to complete the questionnaires ahead or during the in-person assessment. Next, the child was asked to complete various computer-based and behavioral assessments. The family decided whether it would be easier on the child to have the mother wait in the assessment room or in a comfortable waiting area nearby. Throughout this entire session, children were reminded that they could stop or take a break at any time. The behavioral assessments included the snack delay task, tongue task, Head-Toes-Knees-Shoulder game, and day/night task. The child could opt to complete these tasks in any order he/she wishes. If the child was unable to complete the full assessment battery in one session, the family was invited to return within the next week to complete the remaining

assessments. This session took about 2.5-3 hours total, depending on how many breaks the child needed during assessments. Families were compensated for their participation upon completion.

Measures

Child Measures

Day/Night Stroop Task (in person): The day/night task assesses young children's inhibitory control (Gerstadt, Hong, & Diamond, 1994). In this task, the child is shown a total of 16 pictures in a random sequence that depict either a moon on a dark background or a sun on a white background. When the child is shown a picture of the sun or moon, they are instructed to say the opposite time of day. For instance, if the child is shown a picture of the sun, they should say "nighttime". The total number of correct responses were recorded.

Head-Toes-Knees-Shoulders (HTKS): In this task children are provided with paired behavioral rules (e.g., touch your head/touch your toes) and then asked to do the opposite. For example, if a child is asked to touch their toes, then they should complete the opposite action, and touch their head (Pointz et al., 2008). First, the child completes 10 trials where they are asked to touch either their head or their toes. If the child responds correctly to 5 or more items, in part one, then the second set of paired behavioral rules (touch your shoulders/touch your knees) are introduced. If the child produces the correct response immediately, the item is scored 2. If the child self-corrects without prompting, the item is scored 1. If they do not touch the correct part of their body, the item is scored 0. The alpha reliability coefficient in the current sample was high $\alpha = .89$.

Snack Delay: This task is a standard delay of gratification task (Willoughby, Kupersmidt, & Voegler-Lee, 2012), in which children watch a snack being placed under a cup in front of them, and are instructed to keep their hands flat on the table until they are told they can have a

snack. Four trials (30, 60, 120, 180 seconds) are administered, and scored on a 5-point rating (0 = eats snack; 4 = waits until the end). The mean score across trials is used as a measure of delay ability. To ensure that snacks are safe and appropriate for the children, mothers are invited to select a snack that their child likes and can eat (e.g., due to allergies) from an array of several snacks. Alpha reliability coefficient in the current sample was $\alpha = .86$.

Tongue Task: The tongue task is similar to the snack delay task. The child places a piece of candy on their tongue and must wait until a bell is rung to eat it. Four trials are administered (10, 15, 20, 30 seconds), and coded to reflect the length of time before the child ate the candy. The average score across the four trials is recorded as the final score (Murray & Kochanska, 2002). As with Snack Delay, mothers are invited to help choose the candy for the child. Alpha reliability coefficient in the current sample was $\alpha = .72$.

Externalizing & Internalizing Behaviors: The Behavioral and Emotional Screening System (BESS; Kamphaus & Reynolds, 2007) is a 29-item questionnaire designed to determine the behavioral and emotional strengths and weaknesses of children between the ages of 3 and 18 years old. This measure consists of items relating to four dimensions of behavioral and emotional functioning including Adaptive Skills ($n = 9$ items), Externalizing Problems ($n = 8$ items), Internalizing Problems ($n = 9$ items), and Aggression ($n = 9$ items). Items are scored on a 4-point Likert-type scale. A T-score is used to classify children as having normal, elevated, or extremely elevated levels of risk. The scores on Internalizing and Externalizing subscales were used in the present study, with adequate reliability demonstrated (Externalizing Problems $\alpha = .83$; Internalizing Problems $\alpha = .75$).

Child's Effortful Control: The Children's Behavior Questionnaire Very Short Form – (CBQ-VSF; Rothbart, Ahadi, & Hershey, 1994) is a 36-item informant-report questionnaire

assessing temperament of children (ages 3 – 8 years). The questionnaire is designed to capture three broad dimensions: Surgency/Extraversion ($n = 12$ items), Negative Affectivity ($n = 12$ items), and Effortful Control ($n = 12$ items). Mothers are asked to rate their child based on how they feel that their child's reaction is likely to be in a variety of situations. Responses are given on a 7-point scale ranging from 1 (extremely untrue of my child) to 7 (extremely true of my child). The alpha reliability coefficient for the Effort Control subscale in the current sample was .64.

Parents' Measures

Demographics. Biological mothers provided demographic information via an in-person interview with research assistants. The present study included demographics such as child age, child race/ethnicity, child sex, parent age, parent sex, parent race/ethnicity, annual household income, parent education level, and parent marital status.

Marital satisfaction. The Dyadic Adjustment Scale (DAS; Spanier, 1976) is a 32-item relationship adjustment self-report measure filled out by both caregivers independently. This measure assesses the quality of marriage and similar dyads. The scale is comprised of four subscales: Dyadic Consensus ($n = 13$ items), Dyadic Satisfaction ($n = 10$ items), Dyadic Cohesion ($n = 5$ items) and Affectional Expression ($n = 4$ items). The Dyadic Consensus (DC) assesses the level of agreement and disagreement between partners on topics such as free time management and finances or religion, friendships, and home organisation. The Affective Expression (AE), assesses how the couple expresses their inner feelings, love, and sexuality. The Dyadic Cohesion (DH) assesses the amount of time spent by the partners on mutually enjoyable activities such as social interests, dialogue, or having common goals. The last subscale, Dyadic satisfaction (DS), assesses the happiness or unhappiness perception in a couple's relationship,

such as the frequency of quarrels, the pleasure of spending time together or otherwise, and the contemplation of separation or divorce. The sum of these four scales provides a total index that expresses the Dyadic Adjustment. Higher scores indicate greater marital quality and marital adjustment. For this study, coefficients alpha ranged from .70 (for the 4-item Affectional Expression subscale) to .95 (for the 32-item Total score). These results suggest the DAS and its 4 subscales are internally consistent and stable over the interval examined in this study. Alpha reliability coefficient in the current sample was high ($\alpha = .90$).

Coparenting. In order to measure the extent to which a parent perceives that her spouse is supportive in child rearing, the Perceptions of Coparenting Partners Questionnaire (PCPQ; Stright & Bales, 2003) was used. This is a 14-item questionnaire that measures the perceived spousal agreement about child problems and perceived support in child rearing. Items are rated on a 5-point Likert scale (1 = Never; 5 = Always). The alpha reliability coefficient in the current sample was high ($\alpha = .90$).

CHAPTER III

RESULTS

Analysis Overview and Power Analysis

SPSS was used to conduct a variety of data analyses to address the research questions for this study. Descriptive statistics, mean comparisons, bivariate correlations, and regression analyses were run. Results of a post hoc power analysis demonstrated that this study is underpowered. A post hoc power analysis with a sample size of 76 was run using a 2 tailed alpha set to $p = .05$. Power was .24 to detect an $sr = .2$. Given that this was an underpowered study, we used $sr = .2$ or greater to indicate clinically meaningful results. Clinically meaningful findings (in addition to statistically significant findings with $p < .05$) were interpreted.

Sample Demographics

Table 1 shows the distribution of the sample ($N = 76$) including the mean and standard deviation, or number and percentage of the category of interest for mother and child variables. Analysis of these variables indicated that the data were normally distributed with no significant outliers or skewness. Mothers were on average 34.41 years old ($SD = 4.96$). A majority of this sample identified as White (92.10%) and were all living with their partners ($n = 70$ married; $n = 6$ cohabitating; 88.2% living with child's biological father). The majority of mothers in this sample ($n = 56$; 73.70%) had a college degree or higher and were employed either full- or part-time ($n = 51$; 67.20%). The average annual household income for this sample was \$79, 316.76 ($SD = 48602.48$). On average, the target child was 4.10 years old ($SD = 0.77$) and 51.30% were male. In order to participate in this study, the child had to have not been identified with developmental disability or learning problems.

Table 1

Demographic Information for Mothers and Children (N = 76)

Mothers		Children	
Characteristic	<i>M</i> or % (<i>SD</i>)	Characteristic	<i>M</i> or % (<i>SD</i>)
Age (years)	34.41 (4.96)	Age (years)	4.10 (.77)
% Married	92.10	% Male	51.30
% White	92.10	% White	89.50
% Unemployed	32.80	% English lang. at home	97.40
% Employed full-time	38.20	% At daycare/school	68.40
Annual income (in \$)	79,316.76 (48,602.48)	% with siblings	78.90
% with gov. assistance	39.50		
% with college degree	73.70		
% living w. bio father	88.20		

Question 1: “What are the relations between child’s inhibitory control and marital satisfaction?”

Consistent with Garon, Bryson, and Smith (2008), we distinguished between simple response inhibition and complex inhibitory control paradigms and included both. Simple response inhibition paradigms have minimal working memory demands, in which a child is given the opportunity to delay or the rule to inhibit a prepotent response. Examples of simple response inhibition tasks include delay of gratification (i.e., Snack Delay, Tongue Task). By contrast, complex inhibitory control (i.e., Day/Night, HTKS) paradigms have greater working memory demands because children are instructed not only to inhibit a prepotent response, but also to respond in a certain way to a salient, conflicting response option. In this study we focused on both simple and complex inhibitory control tasks as it allowed us to assess for behavioral accuracy and duration of delay.

Table 2 shows the descriptive information on the inhibitory control tasks as measured through behavioral tasks within the laboratory setting. In order to examine the correlation among complex and simple inhibitory tasks bivariate correlations were run. Table 3 shows the results of the bivariate correlations indicating that majority of the tasks were significantly and positively correlated with each other with the exception of HTKS and Snack Delay tasks ($r = .21, p = .07$).

Table 2

Descriptive Information for Children's' Inhibitory Control (N = 76)

Tasks	<i>M</i>	<i>SD</i>
Simple		
Snack Delay (score for delay)	2.15	1.66
Tongue Task (number of seconds)	15.62	5.93
Complex		
HTKS (score for accuracy)	19.37	18.90
Day/Night Stroop (% of accuracy)	65.46	35.65

Table 3

Bivariate Correlations for Complex and Simple Inhibitory Tasks (N = 76)

Variable	1	2	3	4
1. Snack Delay	-			
2. Tongue Task	.31**	-		
3. HTKS	.21	.36**	-	
4. Day/Night Stroop	.36**	.40**	.55**	-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

To address the first research question, the first step of the analysis was to create an inhibitory control composite variable that represent overall inhibitory control abilities based on the data collected from simple and complex inhibitory control tasks. As such, normalized scaled scores were computed for each of the measures included in Table 2 and 3. These were then averaged together to create a normalized composite scaled score. Additionally, Pearson correlations were computed to estimate test-retest reliability

Additionally, previous research shows that, compared to structured lab tasks, naturalistic measures may more accurately replicate a child's executive functioning in real life (Barkley, 2012). Although the emphasis of the present study was on behavioral tasks, we also incorporated parent-report questionnaires including the Children's Behavior Questionnaire (CBQ; Rothbart, Ahadi, & Hershey, 1994) - Very Short Form, as well as internalizing and externalizing subscales of Behavioral and Emotional Screening System (BESS; Kamphaus & Reynolds, 2007). These questionnaires were chosen as a point of comparison to behavioral measures used in the lab because of their relevance to the construct and the overall importance of incorporating multiple methods of assessment to estimate the amount of method variance. Both questionnaires reflect mothers' impressions of child behavior and temperamental inhibitory control across many relevant situations over long periods of time, unlike the structured lab tasks which provide information in one setting at one time point. Table 4 provides descriptive information on the study variables of interest for mothers and children, including the Children's Behavior Questionnaire, externalizing and internalizing standard score of the Behavioral and Emotional Screening System, Perceptions of Coparenting Partners Questionnaire, Dyadic Adjustment Scale and the composite inhibitory control variable that was mentioned above.

Table 4

Descriptive Information for Mothers and Children (N = 76)

Characteristic	<i>M</i>	<i>SD</i>
Mother		
DAS- Dyadic Adjustment	50.84	8.70
PCPC- Coparenting Support	4.25	0.52
Child		
IC-Composite	0.03	0.71
BESS- Externalizing Behaviors	7.33	3.89
BESS- Internalizing Behaviors	6.87	2.87
CBQ- Inhibitory Control	4.00	0.63

Finally, in order to address the first question, bivariate correlations were run. Results of the bivariate correlations are represented visually in Table 5. Higher child inhibitory control was found to be significantly associated with higher maternal years of education ($r = .35, p = .03$), household income ($r = .30, p = .01$), child's age ($r = .50, p = .01$), and coparenting support ($r = .30, p = .01$). However, inhibitory control of the target children and their mothers' report of marital satisfaction were not found to be correlated ($r = .27, p = .25$). Similarly, children's level of externalizing, internalizing behavior, and mother's report of inhibitory control temperaments were not correlated with their mothers' report of marital satisfaction ($r = -.19, p = .11$; $r = -.13, p = .26$; $r = .14, p = .28$). Additionally, maternal years of education, household income, and child's age found to be not correlated with mothers' report of marital satisfaction ($r = -.06, p = .60$; $r = -.05, p = .68$; $r = -.02, p = .85$). Thus, the hypothesis that there is an association

between children's inhibitory (based on behavioral observation and parents report) and marital satisfaction was not supported

Table 5

Bivariate Correlations and Descriptive Statistics for Child and Mother Variables (N = 76)

Variable	1	2	3	4	5	6	7	8	9
1. IC Composite	-								
2. DAS	.27	-							
3. PCPQ	.30**	.64**	-						
4. Income	.30**	-.05	-.02	-					
5. YrsEducation	.35*	-.06	.00	.47**	-				
6. CBQ-EC	.18	.14	.14	.05	.01	-			
7. BESS int.	-.02	-.13	-.03	.04	-.00	-.10	-		
8. BESS ext.	-.29	-.19	-.21	-.21	-.18	-.21	.68**	-	
9. Child Age	.50**	-.02	-.10	.25*	-.17	.17	.13	-.01	-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. IC = Inhibitory control

Question 2: “Does coparenting mediate the relation between child’s inhibitory control and parental marital satisfaction?”

In order to address this question a mediation analysis was performed in line with Baron and Kenny’s (1986) procedure. Three simple linear regression were used to test basic assumptions regarding the relations between child inhibitory control, parental marital satisfaction, and coparenting support (mediator). Table 6, 7, and 8 show the results indicating that the basic assumptions of mediation were not fully met. In Step 1 of the mediation model, the regression of child’s inhibitory control on material satisfaction, controlling for child’s age, was not significant ($b = 2.96, t = 1.80, p = .09$). Therefore, changes in inhibitory control are not associated with changes in marital satisfaction.

Table 6

Linear Regression Analysis for Variables Predicting Marital adjustment (N = 76)

Variable	<i>B</i>	<i>SE B</i>	β
Child’s age	-.25	1.32	-.02
Child’s inhibitory control	2.96	1.64	.24
R^2		.04	
F		1.64	

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

Step 2 showed that the regression of child's inhibitory control scores on the mediator, coparenting support, controlling for child's age, were significant ($b = .34, t = 3.86, p = .001$). As a child's inhibitory control increases, coparenting support increases too. Step 3 of the mediation process showed that the mediator (coparenting support), controlling for child's age, significantly predicted marital satisfaction ($b = 11.37, t = 6.74, p = .001$). Due to the lack of association indicated in Step 1, all four conditions of mediation were not met. Thus, the hypothesis that the coparenting support mediated the association between child inhibitory control and marital satisfaction was not supported.

Table 7

Linear Regression Analysis for Variables Predicting Inhibitory Control (N = 76)

Variable	<i>B</i>	<i>SE B</i>	β
Child's age	-.07	.08	-.10
Coparenting support	.34	.09	.47**
<i>R</i> ²		.01	
<i>F</i>		7.94**	

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

Table 8

Hierarchical Linear Regression Analysis for Variables Predicting Marital adjustment (N = 76)

Variable	<i>B</i>	<i>SE B</i>	β
Child's age	1.16	1.25	-.10
Child's inhibitory control	-1.37	1.44	-.11
Coparenting support	11.37	1.69	.70**
<i>R</i> ²		.42	
<i>F</i>		16.93**	

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

CHAPTER IV

Discussion

Findings from this study indicate that coparenting behavior may play an interactive role in relation to children's inhibitory control. In particular, current findings indicate that higher coparenting support is significantly and positively correlated with inhibitory control in children. This is consistent with previous findings by Schoppe-Sullivan et al. (2009) showing that supportive coparenting served as a buffer for children with low effortful control. However, similar to their study, the present study does not explicate the mechanism through which coparenting behavior act as a protective factor for children with lower inhibitory control. Given the large body of research linking marital dynamic to children's functioning (Cummings & Davies, 2002), the present study hypothesized that marital relationship quality may underlie the association between coparenting and inhibitory control. However, the present study did not show any association between children's inhibitory control and marital satisfaction. It is possible that the parenting style rather than marital satisfaction explains the variance in children's inhibitory control. Alternatively, according to Karreman et al., (2008), coparenting may foster a sense of family cohesiveness and security in children that make it possible for them to shift their focus on developing timely and appropriate self-regulation skills.

Additionally, unlike the present study, the majority of the studies found a direct association between coparenting and children's externalizing and internalizing behavior (Belsky, Woodworth, & Crnic., 1996; McHale & Rasmussen, 1998; Schoppe, Mangelsdorf, & Frosch, 2001). However, it is important to note that all these studies utilized home observations of coparenting behaviors. Therefore, it is possible that using a self-report measure of coparenting

elicited less undermining behaviors than if families were actually observed for those behaviors at home or in a laboratory setting.

This study also explored behavioral expressions of inhibitory control and how they relate to temperament-based reports of preschool age children inhibitory abilities. This study did not replicate previous findings linking laboratory-based and maternal report of inhibitory control in preschool age children. Findings from this study revealed that individual performance on laboratory-based inhibitory control tasks across conditions of conflict, delay, and compliance were highly correlated with one another but were not associated with temperament-based maternal ratings of preschoolers' inhibitory control. It is important to note that maternal reports of temperament-based inhibitory control is often based on repeated observation across multiple situations and settings by mothers whereas, in this study, the laboratory-based assessments of inhibitory control were only completed once within a well-controlled setup with minimal emotional distress for the child. As such, it is possible that maternal-reports of temperament-based inhibitory control provide important information about a child's executive functioning during this particular developmental milestone that laboratory-based tasks cannot entirely capture.

Finally, findings of the present study indicated that the children's performance on laboratory measures of inhibitory control were correlated within this sample unlike some previous research showing that in younger children (18 to 30 months of age) there were no relations between conflict and delay tasks (Carlson & Moses, 2001; Diamond et al., 1997). However, Carlson, Mandell, and Williams (2004) reported higher consistency across inhibitory control tasks at 36 months of age than 24 months of age. Similarly, Kochanska et al. (2000)

reported that as children age, the consistency of inhibitory abilities increases, which is similar to the findings from the current study.

Limitations

It is necessary to discuss the participants within the current sample and to what extent the results are generalizable to the larger population. The current sample was taken from a larger study conducted in the Pacific Northwest. Children were predominantly White (approximately 89%), as were mothers (approximately 92%). Moreover, the current sample consisted of two-parent and heterosexual families. Additionally, consistent with the exclusionary criteria for the larger study, none of the children in the present study had any known medical or psychological conditions and presented with lower clinical-level behavior problems. This limits the generalizability of the results. Therefore, it is important for the results of the present study to be compared with results for families of diverse backgrounds and cultures with different levels of risk factors to examine the impact these differences may have on a child's inhibitory control and marital relationships.

Additionally, inhibitory control demonstrates continuity in its function but changes in its behavioral manifestation over time (Isquith et al., 2005). This creates major methodological challenges for studying the development of inhibitory control in childhood including construct validity and sensitivity of measures. A strength of the current study is that child behavior was measured both through direct observations and parent report. As mentioned above, with the rating scale method, mothers are able to incorporate ratings of their child's behavior across multiple settings, contexts, and during different situations. However, these questionnaires aim to capture an overall view of inhibitory control in the everyday context with less process-specific information. Furthermore, rating scale methods depend on informant ratings, and therefore may

be affected by rater biases, including atypical developmental expectations of behavior by parents. On the other hand, although the laboratory-based measures provide more process-specific information, the collected data represent a short glimpse into child's functioning within a controlled environment. Overall, although the current study provides early evidence of reliability and validity for preschool inhibitory control measures, future studies should be guided by theory and construct validity, aiming toward better empirical and theoretical approaches to the selection and combination of measures that are developmentally appropriate and sensitive.

Future Directions

The data presented in the current study are from one time point in the developmental period, thus, future studies should follow individuals' differences in the coherence and development of inhibitory control across different developmental periods. It is important to investigate the longitudinal trajectories of inhibitory control, the patterns of change throughout this crucial developmental stage, and the association between inhibitory control and outcome measures such as school readiness and achievement. Additionally, future research should address similar questions that were proposed within this study but with a more demographically and culturally diverse sample that are not limited to two-parent heterosexual families.

Given the multifaceted models of inhibitory control in the developing child, no single method or measure is likely to be adequate in assessing this complex domain. Future work should consider how best to measure inhibitory control across multiple levels of analysis, including bio-psycho-social processes. Future studies should focus on formulating neuropsychological assessment that incorporates the laboratory tests and the behavioral manifestations of inhibitory control within natural settings. Additionally, the collected data must be interpreted in the context of the environmental factors that impact the child's function. For

instance, children's inhibitory control and self-regulation develop through the internalization of rule and expectations in the context of relationships with parents, siblings, caregivers, and teachers. Thus, future work should consider how to account for environmental influences in the development of inhibitory control and the bidirectionality of this association. As measures of inhibitory control, self-regulation and overall executive functioning become more common for preschool children in the clinical context, it is important to focus on balancing internal validity and ecological validity in order to better guide assessment and the subsequent intervention planning.

Conclusion

The present study has drawn further attention to coparenting and its link to child's inhibitory control and temperamental characteristics. Early child development research has called for more systematic attention to holistic parenting interventions based on social learning theory and family systems theory. Parenting interventions hold great promise for the promotion of healthy children and healthy families in ways that comprehensively impact the parent and child outcomes (Olds, Sadler, & Kitzman, 2007; Panter-Brick & Leckman, 2013). However, very few parenting interventions move beyond the mother-based childrearing practices. These interventions tend to neglect fathers' roles and the potential positive and negative impacts that father's absence or presence may have on the overall child-wellbeing and family functioning (Panter-Brick et al., 2014). More holistic parenting interventions should aim to engage both parents and use a rather systematic approach to address family dynamics, child-wellbeing, caregiver mental health, quality of relationships between parents, parenting competency, and coparenting.

The present study also brought attention to issues of measurement of inhibitory control, a key component of self-regulation. It is important to consider how to measure the development of inhibitory control because of the widespread use of inhibitory control measures in early childhood and its relevance to the development of psychopathology. As researchers place greater emphasis on measuring inhibitory control using multiple measures, there is a need to understand how these measures function at different ages and how the result may be different within one's ecological model as varied systems of the environment and interrelationships among these systems shape a child's overall development.

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