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**Student Research**

***Measures of Challenging and Excitatory Parenting Behavior  
as Predictors of Later Child Self-Regulation\****

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**ABSTRACT**

Challenging and excitatory parenting behaviors play an important role in children's development, particularly in regard to the development of self-regulation; however, no well-established measures of parent-child interactions exist that record such behaviors. In the current study, I compare two recently developed coding systems that intend to address this issue: the Risky Interaction Support and Challenging (RISC) and Marbach coding systems. A subset of videos from the New Parents Project (NPP) data set at 12 and 18 months was coded using both scales, then a factor analysis was conducted for each scale. Regressions were conducted to look at the predictive power of each scale on children's self-regulation at two and seven years. I hypothesized that the Challenging Regulatory Competence (CRC) and the Excitation, Arousal, and Destabilization (EAD) subscales of the RISC and Marbach scales, respectively, would have the most predictive power for later self-regulation. The regressions did not support the hypotheses, revealing no significant relationship between one-year parent behaviors and later self-regulation.

**KEY WORDS** Child Development; Self-Regulation; Activation; Fathers; Emotion Regulation

In the field of child development, it has long been established that mothers have important influences on children's developmental outcomes (e.g., Iskoldskiy 1985). Mothers have been viewed as the primary caregiver and therefore as more important than fathers for children's development. Over the past few decades, however, as more women

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enter the workforce and men become more involved in caregiving with their children, researchers have gained interest in studying fathers and the effects they may have on children's developmental outcomes. There has been a debate within the field about whether mothers and fathers have the same effect on children or if they each have unique influences on different aspects of children's development. Although the debate continues, a third, hybridized, perspective that mothers and fathers have different but complementary roles that have similar as well as unique influences on children's development, has been gaining support throughout the field (Cabrera et al. 2014).

Bowlby's (1977) theory of attachment and exploration supports this complementary view of mothers and fathers. In his theory, Bowlby identifies two patterns of behavior: attachment behavior and exploration behavior. These behaviors characterize types of relationships between a parent and child. The main goal of the attachment relationship is security; when a child needs help, the child can call for his or her attachment figure, and the secure base will provide the child with comfort and return the child to his or her emotional baseline. Once this need for security and comfort is met, however, the child tends to leave the caregiver and start exploring his or her surroundings. Bowlby describes these two relationships as antithetical because one is based on maintaining proximity to a caregiver while the other is based on encouraging the child to explore away from a caregiver. Although the roles are contradictory, each is necessary for the other to work optimally, because the child needs a secure base from which to explore and to return to if necessary, and someone to sensitively encourage said exploration once the child is away from the secure base. Neither the attachment nor exploration role is inherently gendered such that only mothers can be attachment figures and only fathers can be exploration figures; however, we find that in most cultures, this is how parents split the roles (e.g., Grossmann et al. 2002; Paquette 2004). A number of factors exist that could potentially lead to this pattern in parenting (see Cabrera et al. 2014), but such a discussion falls outside the scope of this article.

Parenting (from both fathers and mothers) has an important influence on the development of self-regulation in children as well as on positive outcomes later. Positive parenting (e.g., authoritative, warm, and respectful of child views and autonomy) yields positive outcomes such as better child self-regulation, whereas negative parenting (e.g., authoritarian, punitive discipline, negligence, focus on child compliance, negative affect, and hostility) can have an adverse effect on children's self-regulation. Positive parenting is associated with better emotion regulation, attentional regulation (Williams and Berthelsen 2017), and self-regulation broadly (Brody and Ge 2001).

Ren et al. (2017) suggest that fathers in particular play a crucial role in the development of children's self-regulation. Their research showed that paternal supportive parenting moderated the effect of child behavioral regulation (BR) on both number competence and externalizing problems. The first interaction effect showed that child BR influenced number competence only when there were high levels of paternal supportive parenting. The second interaction effect showed that when the child had low BR, paternal parenting had no effect but when the child had high BR, low paternal supportive parenting led to higher levels of externalizing problems while high paternal supportive parenting led to lower levels of externalizing problems. The only effect of maternal parenting showed

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that maternal aversive parenting led to lower levels of child self-regulation. Although Ren et al. (2017) suggest that fathers play a crucial role in children's development of self-regulation, most self-regulation research looks at only mothers or at mothers and fathers combined, rather than at fathers individually (Eisenberg, Spinrad, and Eggum 2010).

**WHY IS SELF-REGULATION IMPORTANT?**

The development of self-regulation is important through late adolescence and into early adulthood; however, early childhood in particular is a sensitive period for the development of self-regulation (McClelland et al. 2018). Self-regulation development can lead to a number of positive outcomes, including emotional, cognitive, academic, and behavioral. Better child self-regulation is associated with fewer internalizing problems (although research on self-regulation and internalizing problems has some inconsistencies. Studies that use attentional control as a measure of self-regulation are more consistent than those that use inhibitory control; Eisenberg et al. 2010) and mediates the relationship between parenting quality and both better psychological functioning (i.e., fewer depressive symptoms, less hostility, and higher self-esteem) and less alcohol use (Brody and Ge 2001). In terms of academic outcomes, better self-regulation is also associated with higher levels of school readiness, better learning outcomes (McClelland et al. 2018; Ren et al. 2017; Ursache, Blair, and Raver 2012), and higher chances of high school and college graduation (Moffitt et al. 2011). Childhood self-regulation is also associated with higher levels of prosocial behavior (Williams and Berthelsen 2017), better overall health, higher socioeconomic status, higher income, better financial planning and security, fewer financial struggles, lower chance of substance dependence, lower chance of being a single parent, and fewer criminal convictions as much as 32 years later (Moffitt et al. 2011).

The Ren et al. (2017) study supports more recent fatherhood and parenting researchers, such as Grossmann et al. (2002), Paquette (2004), and Cabrera et al. (2014), which have shown that fathers play a particularly important role in children's development. In particular, fathers play an important and unique role in play. Fathers tend to be more active, challenging, and excitatory in play settings as compared to mothers (see Paquette 2004; Cabrera et al. 2014). These sorts of excitatory and challenging parenting behaviors push children to go out of their comfort zones, forcing them to activate regulatory capacities such as attentional, emotional, behavioral, and cognitive regulation. By pushing children to activate their regulatory capacities in a controlled and fun environment, fathers give children a place to experience and practice their regulatory functions in a low-risk setting, which in theory should lead to better functioning of those regulatory capacities, and thus better self-regulation.

**LACK OF FATHER-INCLUSIVE PARENTING MEASURES**

Although Bowlby made the distinction in parenting patterns in 1977, the child-development field has seemingly overlooked fathers and their influence on children through the exploration relationship. Most research has been focused mainly on mothers

and the mother-child attachment relationship, although fatherhood research has been gaining attention in recent years (Majdandžic, de Vente, and Bögels 2016). Because father-specific research in the child-development field has long been neglected, the breadth of published research and literature to date is quite limited. In the work that has been done, many of the researchers have attempted to employ measures in fatherhood research that were developed for mothers (Cabrera et al. 2014).

The lack of breadth in fatherhood research has led to a lack of adequate established parenting measures that are inclusive to the types of behaviors that are more typical of fathers (see Havlin 2018); however, two recently developed measurement scales were designed to be more inclusive of these types of behaviors while being applicable for both mothers and fathers. The first is the Marbach scale, developed by Brenda Volling, Matthew Stevenson, Natasha Cabrera, and Daniel Paquette, and the second is the Risky Interaction Support and Challenging (RISC) scale, developed by Eric Olofson and Sarah Schoppe-Sullivan (Volling et al. 2018). Both scales were developed at similar times and are grounded on the same theoretical basis (Paquette 2004).

## **DEFINITIONS OF SELF-REGULATION**

Within the child-development and self-regulation literature, there seems to be a range of definitions for self-regulation and which measures are used to assess it. Some researchers use the terms “self-regulation,” “self-control,” “effortful control,” and “executive function” relatively interchangeably. For the sake of clarity, the current article uses the following definitions of self-regulation: Ursache et al. (2012) define self-regulation as the arousal and management of cognitive systems “that facilitate the use of [executive-function] abilities in the service of goal-directed actions.” This definition is supported by McClelland et al. (2018), who, in their literature review of self-regulation research, further specify their definition of self-regulation as a composite construct that employs cognitive faculties such as executive function, effortful control, and emotion regulation. They further divide executive function into components such as attentional control, inhibitory control, and working memory. Thus, self-regulation is a composite construct that encompasses cognitive systems that regulate and manage attention, cognition, emotion, and behavior (Eisenberg et al. 2012; McClelland et al. 2018; Ursache et al. 2012).

## **THE CURRENT STUDY**

The current study uses two father-focused (but not father-only) measures of parenting behavior to look at the effects of challenging and excitatory parenting behavior on children’s self-regulation over time. This study adds to the literature by looking at mothers and fathers separately, which previous self-regulation research generally has not done. Secondly, it uses measures of parent behaviors that are specifically designed to be more inclusive toward the types of parenting behaviors that are typical of fathers, rather than general parenting measures such as parenting styles, sensitivity, and warmth.

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Because this study employs two similar measures of challenging and excitatory parenting behavior, I propose two hypotheses: (1) Within the RISC scale, challenging regulatory competence at one year will have the strongest association with self-regulation later in life, and (2) within the Marbach scale, excitation, arousal, and destabilization at one year will have the strongest association with self-regulation later in life.

**METHODS***Sample*

The current study used archival data from the New Parents Project (NPP; for demographic information see Schoppe-Sullivan et al. 2014). Data were collected from the 12–18-month observations as well as from the 2-year and 7-year follow-up studies.

*Measures*

**Revised Infant Behavior Questionnaire–Very Short Form (IBQVSF).** At child age 9 months, mothers and fathers independently completed the IBQVSF (see Putnam et al. 2014; for more information about data collection, see Altenburger et al. 2017). The IBQVSF is a 37-item measure of all three components of child temperament (surgency, negative affect, and effortful control); however, the current study used only parent reports of effortful control as a control measure, as it has been shown to be associated with later self-regulation.

**Risky Interaction Support and Challenge Scale (RISC).** Parent behavior measures at 12 and 18 months were recorded using five subscales from the RISC scale (Olofson and Schoppe-Sullivan 2018). The RISC scale is a coding scale used to capture different types of parenting behaviors during parent-child interactions in which the parent may, but is not required to, help a child overcome challenges. It was designed specifically to be more inclusive toward parenting behaviors that are more typical of fathers (i.e., excitation, encouraging risk-taking, and the like). Scores are assigned to each subscale using a combination of micro-coding and global scores. Coders watch the recorded interaction multiple times, taking notes on every instance of behavior that fits each subscale, and decide its intensity (low, moderate, or high). After the coders have watched the video several times and recorded every codable behavior, they then determine the global scores. Each subscale is scored separately on a 5-point scale from 1 (“the relevant behavior is not at all characteristic of the interaction”) to 5 (“the parent shows strong behavior”). The global score is decided based on a combination of the frequency and intensity of the recorded behaviors, with higher scores reflecting more frequent and higher intensity instances.

**Physical Challenging Behavioral Competence (PCBC).** PCBC reflects the extent to which the parent challenges the child to go beyond his or her comfort zone by attempting difficult tasks, taking risks, and striving for the child’s potential behavioral

competence. Behaviors that fit within this construct encourage children to attempt things beyond their current abilities and/or to develop cognitive abilities that aid in the development of behavioral competence. Examples of PCBC are physical contact, object-mediated play, or encouragement to attempt a more challenging task than the current task.

***Challenging Regulatory Competence (CRC).*** CRC behaviors are those that challenge children's self-regulation or encourage self-regulatory efforts. Examples of CRC are destabilizing the child by eliciting an emotional reaction, interrupting the child while he or she is attempting to complete a task, and supporting and encouraging a child's attempt at self-regulation.

***Overprotection.*** Parent behaviors that are overprotective are those that show exaggerated concern for the child's safety when there is no danger present. Overprotective behaviors can also be those that show excessive worry in situations in which danger is present but is acceptable or warranted (e.g., risk of harm when riding a bike). Overprotection can be either physical or expressive. A parent may physically restrain the child or remove the child from a situation or may restrict the child's behavior using facial expressions, body language, or speech (e.g., saying, "Don't do that!" or looking at the child with side eye).

***Autonomy Allowance.*** Autonomy allowance refers to parent behaviors that "allow children to autonomously pursue activities that are outside of their comfort zone, beyond their current abilities, or contravene typical expectations of behavior by simply attending to the child's activities while adopting a stance of non-intervention" (Olofson and Schoppe-Sullivan 2018:6). This subscale is different from other subscales because it is used to code attentive nonaction rather than direct parental involvement.

***Marbach Coding Scale.*** Parent behavior measures at 12 and 18 months were also coded using two subscales of the Marbach coding scale (Volling et al. 2018). The Marbach scale was developed to include parent behaviors that are more typical of fathers (i.e., challenging and excitatory play) than did previous coding scales, although the scale is not exclusively for coding father-child interactions. The scale is meant to be used to code parent-child observations in which there is an opportunity for the parent to push the child in physical, cognitive, social, and/or competitive ways. Scores are assigned to the subscales of the Marbach using global scores. The coder watches the observation multiple times, taking notes on behaviors that fit the subscales, and provides an initial score. Subscale scores are on a 5-point scale from 1 ("Very low ACB/EAD") to 5 ("Very high and consistent ACB/EAD"). After the initial score is given, the coder watches the observation another time to confirm or correct the initial score, and then a final score is given.

***Active Challenging Behavior (ACB).*** The ACB construct reflects the extent to which the parent pushes the child to take on challenges, leave his or her comfort zone, and

take risks. The Marbach scale uses Vygotsky's zone of proximal development (ZPD) to understand challenging parental behavior as pushing the child into the child's ZPD rather than letting the child do only what the child has already accomplished and is comfortable with (see Volling et al. 2018).

***Excitation, Arousal, and Destabilization (EAD).*** The EAD construct reflects the extent to which parents sensitively inject unpredictability into the parent-child interaction such that the child must activate his or her regulation of physical, cognitive, or emotional processes. EAD behaviors are intentional disruptions in the ongoing interaction that momentarily arouse the child to a state of heightened emotion or attention, then resume the previous interaction.

**Infant-Toddler Social and Emotional Assessment (ITSEA).** The ITSEA was administered to both parents at 27 months to assess a number of child behaviors. Of the many subscales contained in the ITSEA, the current study used only the negative emotionality subscale as a measure of emotional regulation. The negative emotionality subscale consisted of 13 items rated on a 3-point scale from 0 (not true/rarely) to 2 (very true/often). Higher scores on the negative emotionality scale reflect more frequent behaviors, making this a measure of emotional dysregulation rather than of emotional regulation (for more information on the entire ITSEA, see Carter et al. 2003).

**Head Toes Knees Shoulders (HTKS) Task.** Self-regulation measures during the age 7 follow-up study were coded using the HTKS task (Ponitz et al. 2009). The HTKS task in this study is a measure of behavioral regulation. In the task, the child is asked to play a game in which he or she does the opposite of what the instructor says (i.e., when the instructor says, "Touch your toes," the child should touch his or her head). After 10 trials of just head and toes, the instructor adds knees and shoulders as another pair of opposites and conducts another 10 trials with the same instructions as the first 10 trials (i.e., when the instructor says, "Touch your knees," the child should touch his or her shoulders). Six practice trials and 20 test trials contribute to the final score (10 of just head-toes, and 10 of both head-toes and knees-shoulders). Both the practice trials and the test trials are scored on a scale of 0–2, with 0 indicating "incorrect" (the child ended on the incorrect body part), 1 indicating a self-correction (the child showed discernable movement toward an incorrect body part but corrected the movement and ended on the correct body part), and 2 indicating "correct" (the child ended on the correct body part without having to self-correct). The final score is the total of the 26 practice and test trials, making the possible score range 0–52.

## RESULTS

### *Analysis Plan*

Data were analyzed in multiple steps. First, intraclass correlation analyses were run to assess the reliability of the RISC and Marbach scales. Next, factor analyses of the RISC



and Marbach were run to assess the validity of the scales. Finally, multiple regression analyses were run using parent scores on the RISC and Marbach as predictor variables and the 2- and 7-year follow-up data as outcome variables.

### *Preliminary Analyses*

**Intraclass Correlation Coefficients.** Each climber task video was coded by two independent coders. Separate intraclass correlation analyses were conducted for the RISC and the Marbach because two separate research teams coded the one-year videos using only one of the scales. Reliability was very good for all subscales of both coding systems (see Table 1).

**Table 1. Intraclass Correlation Coefficients among Predictor Variables**

Variables	Cronbach's Alpha
<b>RISC</b>	
Physical Challenging Behavioral Competence	.831
Challenging Regulatory Competence	.875
Overprotection	.846
Autonomy Allowance	.849
<b>Marbach</b>	
Active Challenging Behavior	.782
Excitation, Arousal, & Destabilization	.843

**Factor Analysis.** Two factor analyses with Varimax rotations were conducted with all subscales of the RISC and Marbach included in each analysis. One analysis included only mothers' scores, and the other included only fathers' scores. All values under .5 were suppressed. Both mothers' and fathers' scores resulted in similar factor loadings with three components (see Table 2). For fathers, the first component was arousal (EAD and CRC; 1.78, 29.72 percent of variance), the second component was teaching (active challenging behavior and physical challenging behavioral competence; 1.61, 26.78 percent of variance), and the final component was parental intervention (autonomy allowance and overprotection, loaded in opposite directions; 1.52, 25.31 percent of variance). Cumulatively, fathers' arousal, teaching, and parental intervention accounted for 81.81 percent of the variance. For mothers, the analysis revealed the same components in the reverse order: parental intervention (autonomy allowance and overprotection, loaded in opposite directions; 1.73, 28.81 percent of variance), teaching (active challenging behavior and physical challenging behavioral competence; 1.71, 28.46 percent of variance), then arousal (EAD and CRC; 1.67, 27.90 percent of variance), cumulatively accounting for 85.17 percent of the total variance.

**Table 2. Factor Loadings with Varimax Rotation for Parent Scores on the RISC and Marbach Systems**

	<b>Fathers' RISC and Marbach Scores</b>		
	Arousal	Teaching	Parental Intervention
ACB		.851	
EAD	.946		
PCBC		.891	
CRC	.930		
AA			-.828
OP			.890
Eigenvalue	1.78	1.61	1.52
% of Variance	29.72	26.78	25.31
	<b>Mothers' RISC and Marbach Scores</b>		
	Parental Intervention	Teaching	Arousal
ACB		.925	
EAD			.806
PCBC		.752	
CRC			.950
AA	-.885		
OP	.903		
Eigenvalue	1.73	1.71	1.67
% of Variance	28.81	28.46	27.90

*Notes:* AA=autonomy allowance; ACB=active challenging behavior; EAD=excitation, arousal, and destabilization ; PCBC=physical challenging behavioral competence; CRC=challenging regulatory competence; OP=overprotection.

### *Regression Analyses*

Eight multiple-regression analyses were conducted using mothers' and fathers' scores on the RISC and Marbach scales as four separate predictor variables, and negative emotionality and HTKS scores as two separate dependent variables. Mothers' and fathers' reports of children's nine-month effortful control were controlled for in all regression models. Negative emotionality and HTKS scores were not significantly correlated ( $r = -.134$ ,  $p = .315$ ), warranting separate regression analyses for the dependent variables.

None of the regression models were statistically significant. Within the model containing mothers' RISC scores and negative emotionality, mothers' challenging regulatory competence at one year led to lower negative emotionality scores at two years ( $\beta = -.354$ ,  $p = .027$ ; see Table 3). This was the only significant result in all eight models, however, so our hypothesis was not supported.

**Table 3. Regression Model for Mothers' RISC Scores Predicting Negative Emotionality, Controlling for Child Temperament**

Model		<i>B</i>	S.E.	$\beta$	<i>t</i>	<i>p</i> -value
1	F eff. ctrl.	-.032	.063	-.078	-.509	.613
	M eff. ctrl.	-.026	.056	-.070	-.460	.648
2	F eff. ctrl.	-.007	.066	-.017	-.105	.917
	M eff. ctrl.	-.011	.056	-.030	-.198	.844
	PCBC	.025	.046	.080	.532	.597
	CRC	-.099	.043	-.354	-2.292	.027*
	AA	-.006	.048	-.027	-.122	.903
	OP	-.035	.048	-.157	-.719	.476

*Notes:* AA=autonomy allowance; CRC=challenging regulatory competence; F eff. ctr.=fathers' effortful control; M eff. ctrl.=mothers' effortful control; OP=overprotection; PCBC=physical challenging behavioral competencies.

\*  $p < .05$

## DISCUSSION

The regression models showed no support for my hypotheses that CRC and EAD would have stronger predictive power than other subscales, or, moreover, that one coding scale might be more predictive than the other. This is contrary to what would be expected based on previous literature. Based on literature from predominant theorists in the field, such as Paquette, we would have expected the regression models to be significant, showing that teaching and arousal at one year (i.e., RISC and Marbach scores) led to better self-regulation later on. Our models do not support this expectation, however, as none of the models were significant. Although we had fewer expectations for the parental-intervention (autonomy allowance and overprotection) factor, as there is not as much literature from which to formulate a hypothesis in this area, their null results are interesting nonetheless and provide room for further investigation.

Some limitations in the current study may contribute to the insignificant results. Namely, the NPP data set is a preexisting data set that was not collected with this study in mind, resulting in a few effects on this study. First, the measures of self-regulation used in this study (negative emotionality and HTKS scores) are not ideal measures of self-regulation. Because the NPP is a preestablished dataset, however, those were the available relevant measures. Ideally, there would be a more comprehensive measure of self-regulation to use as a single dependent variable. Second, the climber task videos that were coded using the RISC and Marbach scales are not quite challenging or risky enough to be the ideal parent-child task. They were what we had access to in the available NPP data set, however. In order to overcome these limitations, further research should readdress the research question and hypotheses of this study using better measures of self-regulation, as well as a riskier and more challenging parent-child task.

**CONCLUSIONS**

Although my hypotheses were not supported by the regression analyses, this research still contributes to the literature in significant ways. Primarily, it provides some evidence that the RISC and Marbach coding scales are valid and reliable measures of challenging and excitatory parenting behavior. The factor analysis provides some validity for both measures, showing that the subscales are measuring the behaviors that they are expected to. This research also showed that a team of coders can use the scales reliably to measure parent-child interactions; however, further research must be done using these scales to further provide evidence of their validity.

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