THESIS

EXUBERANCE AND EXTERNALIZING BEHAVIOR IN EARLY CHILDHOOD: MODERATING EFFECTS OF GENDER, EMOTION REGULATION STRATEGY KNOWLEGE, AND EFFORTFUL CONTROL.

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In partial fulfillment of the requirements

For the Degree of Master of Science

Colorado State University

Fort Collins, Colorado

Spring 2025

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ABSTRACT

EXUBERANCE AND EXTERNALIZING BEHAVIOR IN EARLY CHILDHOOD: MODERATING EFFECTS OF GENDER, EMOTION REGULATION STRATEGY KNOWLEGE, AND EFFORTFUL CONTROL.

While social and emotional learning (SEL) content that addresses the regulation of negative emotions has garnered significant attention from early childhood educators and researchers, there is evidence to suggest that some children may benefit from increased focus on regulating positive emotions. Children with exuberant temperaments, characterized by high extraversion and surgency and low effortful control, face an increased risk for social and behavioral problems. SEL content specific to exuberance may help these children gain greater control in intensely positive emotional experiences, empowering them to make safe and prosocial choices. The present study investigates the relationship between temperamental exuberance and externalizing behavior problems in preschool age children and the potential influence of factors such as knowledge of exuberance regulation strategies, effortful control, and gender. Using parent reported data on child temperament and behavioral difficulties and scores from baseline assessments of children's knowledge of emotion regulation strategies, this work employs a hierarchical linear regression to test three models of moderation in which exuberance is included as a predictor of externalizing behavior problems, along with one of the secondary predictors. Initial analysis indicated that exuberance accounted for a significant portion of variance in externalizing behaviors. Moderation analyses further revealed that while neither emotion regulation knowledge nor effortful control significantly impacted the relationship between exuberance and externalizing behavior problems, gender was a significant moderator of this relationship.

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INTRODUCTION

Despite a demonstrated relationship between high temperamental exuberance and behavior problems in childhood and adolescence, there is limited research addressing the regulation of exuberance or strategies for helping children develop the skills to do so. All children experience and display exuberance as a discrete emotion at times, but children who display consistent patterns of exuberance and difficulty regulating it face an increased risk for social and behavioral problems (Degnan et al., 2011; Rydell et al., 2007). Children who exhibit high extraversion and surgency and lower effortful control may be said to have an 'exuberant temperament' (Fox et al., 2001; Degnan et al., 2011; Calkins et al., 1996). This is to say, these children may be temperamentally predisposed to experience and display feelings of exuberance more intensely and frequently than average. Educational content that explicitly addresses regulation of exuberance may be particularly beneficial for these children.

Social and emotional learning (SEL) is an essential task of early childhood and is therefore a key focus of early childhood education programs. Many early childhood practitioners use SEL tools such as books, lesson plans, and curricula which offer explicit strategies for identifying and regulating emotions and the intensity with which they are being experienced and how they are expressed. Much of this work centers on the regulation of negatively valanced emotions, such as sadness, anger, and fear, leaving a need for further research on the use of SEL tools and strategies for regulation of exuberance. This work will investigate the relationship between temperamental surgency and externalizing behavior problems among preschool children, examining the roles of exuberance specific regulation strategy knowledge, effortful control, and gender.

Temperament

Temperament refers to individual constitutional differences in profiles of tendencies stemming from the differential activation of defense and approach systems (Rothbart & Derryberry, 1981; Rothbart & Bates, 2006). Temperamental traits can be identified in infancy by observing babies' motor activity, reactivity, sleep, approach and withdrawal behaviors, and attention to stimuli (Rothbart, 1981). As

children age and develop more complex skills, information about emotional expression, social behavior and risk-taking behavior can be integrated to provide a richer understanding of individuals' temperament (Rothbart, 1989). Temperamental traits show a high degree of continuity over time (Fox et al., 2001, Degnan et al., 2011). This is especially true for members of more extreme temperamental groups, such as those who are highly inhibited or highly exuberant (Fox, Henderson et al., 2005; Pfeifer et al., 2002;).

Mary Rothbart offers the primary framework we will use in this study for examining temperament. Rothbart's work identifies three dimensions of temperament that are observable in early childhood: negative affect, effortful control, and extraversion/surgency (Rothbart et al., 2001) Negative affect reflects activation of defense systems and is characterized by experience and expression of negative emotions such as sadness, fear, and anger, and difficulty calming these feelings (Rothbart et al., 2001). Effortful control refers to temperament-based capacities for self-regulation. It can encompass activations of both defense and approach systems including focus and attention shifting as well as inhibitory and activation control (Rothbart & Bates, 2006; Eisenberg & Sulik, 2012). Extraversion/surgency reflects activation of approach systems and is characterized by enthusiastic approach to novelty, activity, high intensity pleasure, and impulsivity (Rothbart et al., 2001).

Temperamental Exuberance

Temperamental exuberance is characterized by increased activation of approach systems, or high extraversion and surgency in Rothbart's framework (Rothbart et al., 2001). These traits can be observed as early as infancy, and furthermore, can be longitudinally predicted based on those early observations (Fox et al., 2001; Lahat et al., 2012). For infants and toddlers, exuberance presents as high motor activity and reactivity, positive affect, and tendencies to approach or react positively to novel stimuli or people (Degnan et al., 2011; Hane et al., 2008; Fox et al., 2001). With age, exuberant children often show high sociability, impulsive and risk-taking behaviors, and attentional bias toward reward (Lahat et al., 2012; Polak-Toste & Gunnar, 2006; Morales et al., 2016; Fox et al., 2001).

Exuberance and Externalizing Behavior Problems

Numerous researchers have identified associations between temperamental exuberance and risk for behavioral problems (Stifter et al., 2008; Rydell et al., 2007; Gartstein et al., 2012; Putnam & Stifter, 2005; Degnan et al., 2011). Early markers of temperamental exuberance during toddlerhood are also related to hyperactivity and impulsivity in early childhood (Frick et al., 2019). This work represents a wide variety of approaches to understanding the traits and processes that shape the relationship between temperamental exuberance and behavior problems.

Attention Bias

Some point to relationships between exuberance and attention bias to reward versus punishment (Morales et al., 2016; He et al., 2017). Exuberance positively predicts both attention bias to reward and externalizing behaviors, which, in turn, are also associated with one another, such that attention bias to reward predicts externalizing behavior in young children (Morales et al., 2016; He et al., 2017). Conversely, attention bias to punishment has been shown to moderate the relationship between exuberance and externalizing behavior, such that exuberant children with lower attention bias to punishment exhibit more externalizing behaviors (He et al., 2017). However, Morales et al. (2016) identified another variable mediating the path between exuberance and attention bias: effortful control.

Effortful control

Effortful control encompasses several skills, including the ability to regulate attention. (Rothbart & Bates, 2006). Children exercising higher levels of effortful control are more able to inhibit impulses and dominant responses, produce alternative responses, and engage and shift their attention to support prosocial and goal-oriented behaviors (Stifter et al., 2008; Carlson & Wang, 2007). Indicators of lower effortful control, such as inattention, are associated with higher levels of externalizing problems (Hill et al., 2006)

Effortful control may also play a central role in the relationship between temperamental exuberance and externalizing behaviors (Dollar et al., 2017). Low effortful control has been associated with exuberance as well as an increased risk for externalizing behavior problems (Morales et al., 2016; Gartstein et al., 2012). Extraversion is also related to challenges with disengaging attention from rewarding stimuli (Rothbart & Sheese, 2007). Furthermore, the ability to control and shift attention has also been associated with lower risk-taking behavior among exuberant children (Lahat et al., 2012).

Dennis et al. (2010) observed a relationship of a different nature linking exuberance and effortful control. For most preschoolers participating in their lab-conducted disappointment tasks, emotion regulation during the task was positively associated with effortful control. Exuberant children, however, consistently exhibited higher levels of emotion regulation during the disappointing task, with no relation to their effortful control. Their findings suggest that exuberant temperament traits may facilitate adaptive or goal-oriented behaviors under certain circumstances (Dennis et al., 2010).

Emotion regulation

Emotion regulation is yet another piece of this complex puzzle. Emotions serve regulatory functions, and, at times, they must be regulated (Barrett, 2013; Rothbart & Sheese, 2007; Pollak, Cole & Camras, 2019). On one hand, emotions often provide motivation for other regulatory processes- such as shifting and focusing attention onto pleasurable stimuli when excited or inhibiting potentially risky behaviors when experiencing fear. On the other hand, emotions may become dysregulated and require the employment of other regulatory skills to manage.

Emotions can become overwhelming or motivate behaviors that conflict with what is socially appropriate or in service of a goal. The ability to regulate these emotions and behaviors is a vital component of adaptive functioning for all people. Evidence suggests that the role of emotion regulation may be particularly important for highly exuberant children (Gartstein et al., 2012). Exuberant children who exhibited more unregulated negative emotion during lab conducted disappointment tasks were found

to exhibit more externalizing behavior problems than their peers (Stifter et al., 2008). Emotion regulation skills have also been implicated as a mediator linking adaptation and novelty seeking, a characteristic of exuberance which is specifically linked to externalizing behavior problems (Polak-Toste, 2006). However, exuberance has also been associated with increased risk for difficulties with emotion regulation (Dennis et al., 2010).

Regulation as a Dynamic Process

In their model, which aims to synthesize various perspectives on self-regulation, Cole et al. (2019) conceptualize self-regulation as the interplay of executive processes (EP) and prepotent responses (PR) and the internal and external factors that influence these. They emphasize that self-regulation is a dynamic process and must be examined as such. It is not sufficient to examine only the appearance or experience of a behavior or emotion, the prepotent response, nor just the enactment of specific regulation strategies, or executive processes. Rather, self-regulation can be understood by considering the relationship between prepotent responses and executive processes.

Interactions Between Internal Processes

While they are separate entities, temperament traits and emotion regulation skills are inextricably related (Cole et al., 2019). Temperament factors influence both the activation and the regulation of emotion. Children with greater effortful control are typically more able to self-regulate their emotions (Dennis, Hong, & Solomon, 2010). However, the experience and intensity of unregulated emotion can also impact the ease with which children can access capacities for effortful control. Negative affect and extraversion/surgency can impact the frequency and intensity with which a child experiences internal states and external circumstances that draw upon their self-regulation skills. For example, exuberant children, who exhibit more approach behaviors, novelty seeking, and attention bias, may be more likely to become engaged in situations that elicit excitement and subsequently struggle more to disengage from pleasurable experiences, even if their behavior has become problematic (Fox et al., 2001; Polak-Toste, 2006; Morales et al., 2016; Rothbart & Sheese, 2007).

Knowledge of Strategies for Regulation

In early childhood, children develop and can discuss several types of emotion regulation strategies, including support seeking, behavioral strategies, suppression, and cognitive reappraisal (Sala et al., 2014). Importantly, any of these types of strategies for regulation could be considered adaptive depending on the context in which they are used (Barrett, 2013; Thompson et al., 2008). An understanding of a broad range of emotion regulation strategies enables children to explore what is most effective for them under different circumstances and with differing availability of resources. In fact, there is a demonstrated negative relationship between diversity of emotion regulation strategies reported by adolescents and their levels of internalizing problems (Lougheed & Hollenstein, 2012).

Experts in emotional development emphasize the importance of examining the experience and processes specific to discrete emotions to develop strategies for optimal regulation (Izard et al., 2011; Cole, 2014). Although many social and emotional learning programs offer strategies for regulation of negative emotion, little attention is given to the regulation of excitement or exuberance. In the present study, children were able to articulate fewer situationally adaptive strategies for regulating situational exuberance than for anger or sadness. It is important to note, however, that the ability to generate and discuss these strategies when directly asked about them in a low stress situation may not translate to the ability to recall and implement them when children are highly activated.

Gender

While there are a variety of more distal factors which influence children's emotion regulation knowledge and abilities, such as ethnicity, socioeconomic status, and parental education, for this work, children's gender may be a particularly salient factor to examine. The period from 2-6 years of age is a critical period during which children develop their understanding of gender differences and begin to show increased motivation to act in accordance with gender norms (Bem, 1981; Martin, Ruble, & Szkrybalo, 2002). Researchers have identified a variety of mechanisms by which gender may impact children's

experience and regulation of emotion. Brody and Hall (2010), describe an approach to understanding gendered differences related to emotion that incorporates a variety of distal factors, such as gendered differences in temperament and language development and family and cultural expectations and socialization, and the interrelations between them.

There is a well-established relationship between gender and both surgency and effortful control. Across various studies and measures, boys are rated higher in dimensions of surgency, and extraversion and girls are rated higher in dimensions of effortful control (Else-Quest, Hyde, & Goldsmith, 2006; Gagne, Miller, & Goldsmith, 2013; Brody & Hall, 2010). Children also experience differential socialization surrounding emotional expression and regulation based on their gender. Although there has been a sharp decrease in explicitly gender differentiated parenting practices in recent decades, gendered differences still commonly appear in the ways that parents respond to their children, choose toys and media for their children, and model gendered roles and ideology (Mesman & Groeneveld, 2017; Morawska, 2020).

Even within the first year of life, mothers have been shown to use fewer words and show less affection when disciplining their daughters than when disciplining their sons (Aznar & Tenenbaum, 2019). These factors interact in complex feedback loops, which exacerbate and elicit differences in behavior and treatment related to gender (Brody & Hall, 2009).

Current Study

The current study aims to further illuminate the relationship between exuberance and early childhood behavioral problems, as well as factors which may exacerbate or help to alleviate these problems, by addressing the following questions. First, is there a relationship between temperamental exuberance and externalizing behavioral tendencies? Next, is this relationship moderated by any of the following factors: children's knowledge of strategies for regulating situational exuberance, level of effortful control, or gender?

METHOD

Participants

The present study is a secondary analysis of pre-test data from a larger study examining the efficacy of the social and emotional learning curriculum, RE-Mind (Barrett & Skoranski, 2017). Participants attended one of three different Fort Collins area early learning centers where RE-Mind was implemented. Sites were chosen based on proximity, availability and connections to research team members.

Of the 211 children who originally participated in the RE-Mind study, 109 had sufficient data for consideration in the present study. Participants were identified by their parents as 55 girls and 54 boys, between the ages of 30 and 63 months (M=46.8, SD= 7.8) with one participant not responding for both variables. Most participating children were identified as white, Euro-American (n=86, 78.9%), 4.6% (n=5) reported their race as Hispanic/Latinx, 6.4% (n= 7) reported their race as "other," and 10.8% (n=11) did not respond.

Parents of participating children also reported levels of education. All parents who responded had completed high school or a GED. A vast majority (n=99, 90.8%) of participating children had at least one parent who had completed a bachelor's degree or higher. More than two thirds of participants, 70.6% (n=77), were children from families with at least one parent who had completed a graduate degree of some kind.

Procedures

At the outset of the study, after recruitment and provision of informed consent, parents were asked to provide information about their child's temperament and behaviors using the Children's Behavior Questionnaire- Short Form (CBQ-SF) and the Strengths and Difficulties Questionnaire (SDQ), described in the following section (Putnam & Rothbart, 2006; Goodman, 1997). Children participated in

pre-intervention testing to assess their understanding of emotion processes, including their knowledge of strategies for regulating strong emotions. Pre-intervention testing was conducted by two members of the research team, at the child's school, using the puppet measures for Emotion Regulation Strategy Understanding described in the following section (Cole et al., 2009). The present study will focus on this pre-intervention testing.

Measures

Temperament

The CBQ-SF contains 94 items, each with a seven-point Likert rating scale in which a score of one indicates that the statement is "extremely untrue of your child," and a score of seven indicates that the statement is "extremely true of your child." Subsets of these items comprise 15 subscales, with six to eight items each, which reflect three broad factor analysis-based scales: Extraversion/Surgency, Effortful Control, and Negative Affectivity. For the present study, only the first two of these scales were utilized.

Exuberance. Exuberance was assessed using parent reports on the Extraversion/Surgency broad factor scale of the Children's Behavior Questionnaire- Short Form (CBQ- SF; Putnam & Rothbart, 2006). Mean scores for the subscales Activity Level, High Intensity Pleasure, Impulsivity, and Shyness (reversed) are averaged to compute scores for Extraversion/Surgency. This broad subscale includes items such as "Likes going down high slides or other adventurous activities," and "Usually rushes into an activity without thinking about it." The full Extraversion/Surgency scale includes 31 items and shows acceptable internal consistency with an alpha of .75.

Effortful Control. Effortful control was assessed using parent reports on the Effortful Control Component of the Children's Behavior Questionnaire- Short Form (CBQ- SF; Putnam & Rothbart, 2006). Mean scores for the subscales Attention Focusing, Inhibitory Control, Low-intensity Pleasure, and Perceptual Sensitivity are averaged to compute scores for Effortful Control. This broad scale includes items such as "Comments when a parent has changed their appearance," and "Can wait before entering

into new activities if asked to." The full Effortful Control scale includes 26 items and shows acceptable internal consistency with an alpha of .74.

Child behavior

Children's behavioral difficulties and prosocial behavior were assessed using parent reports on the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). The SDQ contains 25 items, each with a three-point Likert rating scale on which respondents indicate if the statement is "not true," "somewhat true," or "certainly true" of the child for whom they are responding. Subsets of these items comprise five subscales with five questions each: Emotional Symptoms, Conduct Problems, Hyperactivity and Impulsivity, Peer Relationship Problems and Prosocial Behavior. For these analyses, scores for Hyperactivity and Conduct Problems were added to create a composite score for externalizing problems. The Hyperactivity and Conduct Problems subscales show acceptable internal consistency with respective alphas of .77 and .63. When combined to create the externalizing problems variable, the two scales include 10 items and show an internal consistency of .77.

Understanding of Emotion Regulation Strategies

Emotion Regulation Strategy Understanding was assessed as part of a larger battery of tests assessing emotion knowledge. Strategy understanding was examined using a puppet scenario-based interview conducted directly with children (Cole et al., 2009). Each story explains why the puppets are experiencing an emotion- happiness, sadness, or anger, and why the puppets need to control their expression of the emotion. After each scenario, researchers remind children that the puppets "want to stop acting so _____," (wild, angry, sad) and ask them to generate strategies for the puppets to do this. Responses to the expressive strategy generation portion are scored for their regulatory capacity, social desirability, and type of regulation strategy articulated (problem focused, emotion focused, or venting).

When children can generate no more strategies, the puppets offer three sets of strategies. In each set, one puppet offers a more adaptive and regulatory strategy and the other offers a less adaptive and regulatory strategy (e.g., Find a toy to play with vs. hit one another). Children are asked which strategy

the puppets should use and may answer verbally or by pointing to large cards with a simple picture corresponding to each strategy (Cole et al., 2008).

The current study focuses on children's strategies for regulating happiness and excitement. Children's responses were scored for their regulatory capacity and social desirability. For the purposes of this analysis, composite scores reflecting both scores, referred to as optimization scores, were assigned to each response given by the participant. A score of two is considered optimal. Participants were also given a Total Optimization Score (TOS), representing the total number of optimal strategies given. The TOS scale includes 8 items and has an alpha of .80.

Data Analytic Plan

It was hypothesized that temperamental exuberance would be positively associated with externalizing behavior tendencies. Furthermore, it was hypothesized that these relationships would be moderated such that children who can articulate a greater variety of adaptive strategies for regulating excitement, children with higher levels of effortful control, and girls would exhibit fewer behavior problems. To explore these relationships, this study employed hierarchical linear regression to test three models of moderation in which exuberance is included as a predictor of externalizing behavior problems, along with one of the following secondary predictors: children's knowledge of strategies for regulating excitement, level of effortful control, or gender.

All continuous variables, including age, exuberance, externalizing problems, effortful control, and total optimization score were normally distributed, allowing for the use of regression analyses. Continuous variables were mean-centered before they were entered in the model. Gender was the only categorical variable included in these analyses and was dummy-coded before it was entered in the model. Age was included as a control in initial analyses but did not significantly predict externalizing behaviors in any of the analyses and thus was dropped from the final analyses. Each regression analysis was comprised of two models (steps). The first model contained exuberance and one of the secondary

predictors, entered as main effects. The second step then entered the interaction term, the product of both centered variables, in addition to the two main effects.

RESULTS

Exuberance and Externalizing Behaviors

Simple linear regression was used initially to determine if there was a relationship between temperamental exuberance and externalizing behavior problems. Exuberance did account for a significant portion of the variance, $F(1,107)= 15.10$, $p<.001$. The *R2* value is .124, indicating that temperamental exuberance on its own explained 12.4% of the variance in externalizing behaviors. The unstandardized regression coefficient (B= 1.42) indicates that for each unit increase in exuberance, participants would be expected to exhibit externalizing behavior scores that are approximately 1.42 units higher. As stated previously, age was included in initial analyses, but did not explain a significant amount of variance, $F(1,107)= .179$, $p=.67$. The *R2* value is .002, indicating age explained only .2% of the variance in externalizing behaviors.

Moderation Analyses

Hierarchical linear regression was then used to examine three variables expected to moderate this relationship: emotion regulation strategy knowledge, effortful control, and gender. Continuous variables, strategy knowledge and effortful control, were centered and these centered variables were used to create interaction terms with the centered terms for extraversion/ surgency. The centered variables were entered in their respective models first as main effects, and in the following block as interaction terms to examine the effect of the interaction between the variable and exuberance, over and above their individual effects.

Emotion Regulation Strategy Knowledge

Emotion regulation strategy knowledge did not account for a significant proportion of variance, $F(1,106)= .068$, $p=.794$, with an *R2* change value of .001, accounting for .1% of variance in externalizing behavior. The interaction between strategy knowledge and exuberance had an *R2* change value of .002, accounting for .2% of the variance, $F(1,105)= .255$, $p=.615$. The interaction between effortful control and exuberance had an *R2* change value of .001, accounting for .1% of the variance beyond the main effects, $F(1,105)= .157$, $p=.693$. The final model, including main effects for both

variables and their interaction was significant $F(3,105)= 5.063$, $p<.01$, with an $R2$ value of .126, indicating that the final model overall accounted for 12.6% of variance in behavior.

Effortful Control

The main effect for effortful did account for a significant proportion of variance, $F(1,106)= 55.89$, $p<.001$ with an $R2$ change value of .303, accounting for 30.3% of variance in externalizing behavior. The interaction between effortful control and exuberance had an $R2$ change value of .001, accounting for .1% of the variance beyond the main effects, $F(1,105)= .255$, $p=.615$. The interaction between effortful control and exuberance had an $R2$ change value of .001, accounting for .1% of the variance, $F(1,105)= .157$, $p=.693$. The final model, including main effects for both variables and their interaction was significant $F(3,105)= 26.09$, $p<.001$, with an $R2$ value of .427, indicating that the final model overall accounted for 42.7% of variance in behavior.

Gender

The main effect for gender did not account for a significant proportion of variance, $F(1,106)= 1.176$, $p=.281$, with an $R2$ change value of .010, accounting for 1% of variance in externalizing behavior. The interaction of gender and exuberance did account for a significant portion of variance, over and above their main effects, $F(1,105)= 4.07$, $p<.05$. The $R2$ change value for this model was .032, indicating that the interaction of gender and exuberance accounted for 3.2% of variance beyond the main effects. For this analysis, gender was dummy coded, girls were entered as the test group and boys were used as the reference group. Therefore, the unstandardized regression coefficient (B= -1.45) indicates that for each unit increase in exuberance, boys exhibit an increase in externalizing behavior tendencies that is 1.45 units greater than that exhibited by girls. The final model, including main effects for both variables and their interaction was significant $F(3,105)= 6.95$, $p<.001$, with an $R2$ value of .166, indicating that the final model overall accounted for 16.6% of variance in behavior.

DISCUSSION

As hypothesized, temperamental exuberance did explain a significant amount of variance in externalizing behavior tendencies. Children who are more exuberant are more likely to act impulsively, make riskier choices, and become intensely excited or swept up in more rewarding experiences. Although effortful control did not act as a moderator in these analyses, as a main effect it explained a significant proportion of variance in externalizing behavior tendencies. This is not surprising of course, as effortful control encompasses many of the processes that enable behavioral regulation.

Knowledge of emotion regulation strategies did not account for a significant portion of variance in externalizing behavior, nor did it act as a moderator in the relationship between exuberance and behavior. A variety of factors may help to explain this result. Children who exhibit more problematic externalizing behaviors likely receive more coaching on regulation strategies from parents and teachers than most children and may therefore have a wider repertoire of strategies that they can easily recall outside of emotionally charged situations. These analyses only examined strategies for regulating in moments of positive excitement. It is very possible, however, that many problematic externalizing behavior episodes, especially conduct problems, occur within the context of negative emotional experiences.

Gender did significantly moderate the relationship between exuberance and externalizing behavior, such that exuberance accounted for a steeper increase in externalizing behavior for boys than for girls. However, gender alone did not account for a significant proportion of variance in externalizing behavior tendencies. This suggests that gender specifically interacts with exuberance in ways that lead to more externalizing behavior problems in boys than in girls, which could be explained by a variety of factors.

The measure of exuberance largely focuses on positively valanced reactivity, including high intensity pleasure, and positive approach to novelty. Overall, girls tend to show higher effortful control

than boys (Else-Quest et al., 2006). Negative or distressing conditions may present a challenge to behavioral regulation that is more equally difficult for girls and boys. Exuberant girls may be able to maintain greater control of their behavior under positive or neutral conditions, creating an effect that specifically highlights exuberance related externalizing behavior problems in boys.

Impacts of the interaction between gender and exuberance may also be partially explained by modeling and socialization of gender roles, which allow for and even encourage more aggression from boys. Conversely, femininity is often portrayed as calmer, emphasizing the maintenance of positive physical and social appearances, and frequently placing women and girls in nurturing roles. Children tend to take a particular interest in reproducing gender roles between the ages of three and five years (Bem, 1981; Martin, Ruble, & Szkrybalo, 2002). Under these conditions girls may be more motivated to exert greater control over their exuberant behavior that does not fit into their understanding of what a girl should do.

Implications and Future Directions

The results of these analyses suggest that temperamental exuberance may be a significant risk factor for problems with externalizing behavior. This is consistent with the findings of prior studies which have examined associations between these variables. Neither effortful control, nor emotion regulation strategy knowledge moderated the relationship between exuberance and externalizing behavior. Importantly, these variables were derived from pretest data, meaning that children had not yet participated in the RE-Mind curriculum, which not only teaches but offers numerous opportunities to practice emotion regulation skills. It would be valuable to assess whether knowledge of emotion regulation strategy knowledge has a greater effect on externalizing behavior or its relationship with exuberance after children have participated in RE-Mind.

Gender interacted with exuberance to impact externalizing behavior, such that exuberance predicted a steeper increase in externalizing behavior problems for boys than for girls. It would be

valuable to conduct research that seeks to further explain this relationship and to include trans* and non-binary children as well. Effortful control may be an important factor impacting this relationship, as girls tend to exhibit higher effortful control than boys (Else-Quest et al., 2006).

Limitations

A variety of factors may impact how fully and accurately the measures employed in this study reflect the constructs they aim to describe. Reports of temperamental factors and behavior were made exclusively by parents, who have their own biases and perspective on their children. Children's scores in emotion regulation strategy knowledge are likely impacted by test fatigue, as this measure is located toward the end of a longer set of assessments. Additionally, children's scores on this assessment may have been impacted by distractions in the testing environment, the number of research team members present and children's level of comfort with them, and experiential factors at the time of testing such as hunger, tiredness, or the knowledge that one's class would be going to the playground soon.

To the best of our knowledge, as indicated by parents and teachers, this sample is comprised entirely of non-disabled children. Before age six, however, fewer children have been formally evaluated for conditions that may impact their emotion regulation and executive skills, such as attention deficit hyperactivity disorder (ADHD) and autism spectrum disorder (ASD), though these conditions may already be impacting them. ADHD has been associated with externalizing behavior problems both independently and in interaction with surgency (Martel, 2016). Undiagnosed ADHD or ASD could be a confounding factor that would complicate interpretations of the relationship between temperamental exuberance and behavior.

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