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Predicting preschool children's self-regulation from positive emotion: The moderating role of parental positive emotion socialization

Eunkyung Shin[a,*], Cynthia L. Smith[b], Diana Devine[b], Kimberly L. Day[c], Julie C. Dunsmore[d]

[a] Fralin Biomedical Research Institute at Virginia Tech Carilion, 2 Riverside Circle, Roanoke, VA, 24016, USA
[b] Department of Human Development and Family Science, Virginia Tech, 295 West Campus Drive, Blacksburg, VA 24061, USA
[c] Department of Psychology, University of West Florida, 11000 University Pkwy, Pensacola, FL 32514, USA
[d] Department of Psychological Health and Learning Sciences, University of Houston, 3657 Cullen Blvd, Houston, TX 77204, USA

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ABSTRACT

Guided by the broaden-and-build model, the role that both parent and child positivity play in supporting children's self-regulation was examined. Specifically, parental positive emotional expression and emotion coaching were predicted to moderate the association of children's positive emotions to their self-regulation. Parents rated preschool-aged children's (n = 156) high-intensity and low-intensity pleasure. Parents' positive emotional expression and emotion coaching were coded in an emotion talk task where parents discussed an upsetting event with children. Children's regulation was measured through observed distraction in a frustration task and parental rating of effortful control. Children's high-intensity pleasure was negatively associated with effortful control, whereas low-intensity pleasure was positively related to effortful control. Parents' positive emotional expression when discussing an upsetting event was positively associated with children's distraction and effortful control and moderated the relation of child low-intensity pleasure to distraction. Parents' positive emotion coaching was negatively related to children's effortful control and moderated the relation of children's low-intensity pleasure to distraction. Findings support the idea that parents' socialization of positive emotion is related to children's own low-intensity positive emotion and their self-regulation during early childhood, which is a foundational period for the development of children's self-regulation.

Young children's self-regulation has been related to positive outcomes including better social competence (Spinrad et al., 2007), higher levels of school readiness (Eisenberg, Valiente, & Eggum, 2010), and fewer externalizing problems (Haskett, Stelter, Proffit, & Nice, 2012). Notably, the preschool developmental period is a critical time for self-regulation because preschool children begin to learn about following social norms and engaging in diverse environments without adult support (Grolnick & Farkas, 2002). The potential role that positive emotions could play in children's self-regulation has been overlooked, even though positive emotions may relate to, or even enhance, children's self-regulation. Fredrickson's (2001) broaden-and-build model proposes that positive emotions enhance personal resources. Consistent with this idea, research with adults has shown that positive emotions not only facilitate effective decision-making but may also improve social abilities (Aspinwall, 1998; Tugade & Fredrickson, 2002). To our knowledge, the current study is the first to examine the role that positive emotions can play in young children's emotional self-regulation.

Children's temperament plays a role in self-regulation, especially in early childhood. Temperament contributes to the development of self-regulation through individuals' underlying tendencies for emotional reactivity and regulation (Rothbart & Ahadi, 1994). Considering that modulating reactivity reflects primary self-regulatory processes (Rothbart, Ellis, & Posner, 2011), individual differences in reactivity are related to the capacity to regulate the reactivity. Our view of self-regulation, as the ability to alter reactivity through the effortful control of behavior (Rothbart et al., 2004), recognizes that self-regulation in early childhood is also shaped by experiences in the social environment, particularly those involving parents' emotion socialization (Rothbart & Bates, 2006). Parents provide an environment where children experience and express emotions through parental modeling and guidance (Hoffman, 2001). As parents are the primary socializers of emotions, children first learn to develop strategies to control their emotions within the family context (Haskett et al., 2012). Further, as parents create the emotional climate of the family, children develop self-regulation strategies by interacting with their parents.

* Corresponding author.
E-mail address: shinek@vt.edu (E. Shin).

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Parents' emotionality is likely related to their children's emotionality, and parental modeling of positive emotion may both demonstrate appropriate and effective use of positive emotion and elicit children's positivity (Butler, 2015). Thus, parents' positive emotion socialization, along with children's temperamental positive emotion, can serve to optimize the development of self-regulation. In particular, parents' positive emotion coaching can help children manage distress from negative experiences through positive reframing and optimism (Diamond & Aspinwall, 2003).

Drawing from the concept of goodness of fit (Chess & Thomas, 1991), we explored the interplay between children's temperamental positive emotionality, both high-intensity and low-intensity pleasure, and parents' socialization of positive emotion when discussing an emotional event with children. Specifically, we examined interactions between children's positive emotions and parents' socialization as predictors of children's self-regulation in early childhood. By examining the interaction of positive emotions in both children and parents, the current study expands prior research that has predominantly focused on relations between negative emotions and self-regulation.

1. Positive emotion and self-regulation

From a functionalist perspective, all emotions serve a purpose and may be considered "more or less adaptive in the context of specific goals in particular circumstances" (Thompson, 2011, p.58). In other words, all emotions have regulatory functions in regard to behavior, relationships, thoughts, and physiological arousal that are useful for some goals but may become maladaptive when they persist in circumstances where they interfere with other goals (Thompson, 2011). Fredrickson's (2001) broaden-and-build theory refined and expanded the functionalist perspective on positive emotions, proposing that positive emotions encourage people to persist and discover or develop resources (e.g., mastering a new skill or building social relationships; Fredrickson, 2001). In turn, the personal resources enhanced by positive emotions contribute to adaptation in diverse emotional situations (Fredrickson & Joiner, 2002). Positive emotions improve an individual's thought-action repertoire, allowing them to build more enduring personal resources over time (Fredrickson, 2001). Prior research supports these ideas proposed in the broaden-and-build theory, showing associations between positive emotions and adaptive outcomes in adults, including vagal tone, rhythmic fluctuation in heart rate, better working memory, creative problem solving, and prosocial behavior (Isen, 2000; Kok et al., 2013; Oveis et al., 2009).

Positive emotions may serve as a resource for self-regulation of negative emotions in potentially stressful situations because positive emotions may support more effective attentional focusing, helping children to deal with frustration in more socially appropriate ways and allowing them to achieve their goals. Although negative emotions usefully narrow attention to manage potential threats or obstacles, narrowing attention may interfere with one's capacity to explore situations, instead directing attention toward the source of the negative emotion and maintaining or intensifying negative emotions past the point that is useful (Wells & Matthews, 2014). Research has shown an association between better attentional control skills and lower levels of negative emotions (Gaertner, Spinrad, & Eisenberg, 2008; Lawson & Ruff, 2004). Positive emotions encourage the individual to continue exploring the environment by broadening one's attention (Fredrickson & Joiner, 2002). Thus, children who are higher in positive emotions might be better at distracting attention away from potentially frustrating situations, and positive emotions may allow children to use negative emotions in less maladaptive, more functional, ways. Previous research found that young children's positive emotionality predicted better inhibitory control and self-regulation and was a buffer against behavior problems (Kochanska, Aksan, Penney, & Doobay, 2007; Ku, Feng, Hooper, Wu, & Gerhardt, 2019; Silk, Shaw, Forbes, Lane, & Kovacs, 2006).

In addition to broadening thought-action repertoires, positive emotions have physiological effects that may be pertinent for self-regulation of negative emotions. The experience of negative emotions includes changes in physiological arousal. While these changes serve important functions in the moment, if they linger, they may become detrimental. According to the undoing hypothesis (Fredrickson & Levenson, 1998), positive emotions function to "undo" the physiological after the effects of negative emotions by returning the body to its previous state. Indeed, experimental research shows that cardiovascular reactivity caused by negative emotions more quickly returns to baseline when followed by positive emotions (Fredrickson & Levenson, 1998; Fredrickson, Mancuso, Branigan, & Tugade, 2000).

Positive emotions may function to loosen psychological and physiological arousal of negative emotions by broadening the breath of individual's attention and action repertoire (Fredrickson et al., 2002). Therefore, temperamentally-positive children may be quicker to restore from the physiological aftereffects of negative emotions. Although previous research has demonstrated the role of positive emotions in an individual's regulatory skills, this research has predominantly focused on adult populations (Basso, Schefft, Ris, & Dember, 1996; Isen, 2000; Kok et al., 2013). In the current study, we extend these findings by examining relations between positive emotions and self-regulation in early childhood, which is a foundational period for the emergence of children's self-regulation (Kopp, 1982).

Along with promoting attentional control skills, positive emotions can protect psychological resources and thus support regulation of emotional arousal. Because controlling emotions requires psychological resources to deal with the source of frustration, depleted resources may relate to a lack of regulation skills. Emotionally exhausted individuals are less likely to be able to control their emotions effectively because psychological resources for self-regulation may be limited (Olsen & Kraft, 2008). Positive emotions, however, may allow for psychological resources to be restored and recovered quickly, thus facilitating regulation skills (Tice, Baumeister, Shmueli, & Muraven, 2007). Lazarus, Kanner, and Folkman (1980) suggested that positive emotions bring a psychological respite to depleted coping efforts, and positive emotions may buffer against feelings of emotional exhaustion (Zapf & Holz, 2006).

Children's positive emotionality, however, is not a unidimensional construct. Positive emotionality includes a broad array of positive emotions such as happiness, amusement, and contentment, and each positive emotion has distinctive functions (Cordaro, Brackett, Glass, & Anderson, 2016; Fredrickson, 2013; Shiota, Neufeld, Yeung, Moser, & Perea, 2011). High-arousal positive emotions, including amusement and joy, have been related to increases in physiological responses and sensation seeking whereas low-arousal positive emotions such as contentment and tranquility were related to decreases in heart rate and relaxed responses (Kreibig, 2010). Despite the multidimensional nature of positive emotions, only high-arousal positive emotions have typically been examined (Cordaro et al., 2016). Because high-arousal positive emotions have been associated with extraversion and exuberance (Dollar, Stifter, & Buss, 2017; Shiota et al., 2011), focusing solely on high-arousal positive emotion could overlook the intensity of stimulation, which might have different effects for how positive emotions are related to children's regulation. Furthermore, research suggests that positive emotion variability may be related to maladaptive psychological outcomes (Gruber, Kogan, Quoidbach, & Mauss, 2013), and thus it is important to consider the multidimensional nature of positive emotionality with regard to child out-

comes. Considering a broader array of positive emotions, we examined both high- and low-intensity pleasure in children. Based on prior research indicating the positive association between low-intensity pleasure and self-regulation (Gartstein & Rothbart, 2003; Putnam et al., 2008) and a negative link between high-intensity pleasure and self-regulation (Stifter, Putnam, & Jahromi, 2008), we expected higher levels of low-intensity pleasure would be related to better regulation whereas lower levels of high-intensity pleasure would be related to better regulation.

1.1. Parents' emotion socialization and children's self-regulation

In addition to examining directly how temperamental pleasure relates to children's self-regulation, we also examined parental emotional expression and emotion coaching because parental socialization also plays an important role in how children potentially regulate emotions. As suggested by the goodness of fit model (Chess & Thomas, 1991), children's behavioral outcomes develop from dynamics between children and parents. Thus, exploring the interplay of children's temperamental pleasure and parents' socialization of positive emotion will elucidate how both may contribute to children's self-regulation in an intertwined way. Considering that children fundamentally interact within environments that parents create, especially during the preschool years, parental emotion socialization may optimize or minimize the effect of children's pleasure on their self-regulation.

1.1.1. Parental expression of positive emotion

Parents' emotional expression is a central piece of emotion socialization (Eisenberg, Cumberland, & Spinrad, 1998). Parents demonstrate display rules and convey information about appropriate ways of sharing emotions with children through their own emotional expression. Given that parents' emotionality can relate to children's emotionality through emotional contagion (Butler, 2015), parents' expression of emotion can be a primary emotional environment that children experience. Children who have been exposed to negative emotions are easily overaroused; therefore, they may have difficulty in focusing or shifting attention (Eisenberg, Smith, & Spinrad, 2016). Because emotional arousal interferes in children's adaptive responses by narrowing attentional focus (Fredrickson, 2001), their capacity to manage emotions is more likely to be compromised (Eisenberg et al., 2005). In contrast, children whose parents express more positive emotion were less likely to be overaroused (Liew, Johnson, Smith, & Thoemmes, 2011). Parents' expression of positive emotions creates a secure emotional environment (Morris, Silk, Steinberg, Myers, & Robinson, 2007), which can evoke children's positive emotions so that they can broaden and build their adaptive resources, which can increase their adaptive regulatory strategies. Indeed, children with parents who expressed positive emotion and affection showed better behavioral regulation (Deffaa, Weis, & Trommsdorff, 2020; Jones et al., 2008).

Parents who are higher in positive emotions would also recover from negative emotions more quickly and thus be more likely to model adaptive responses to emotions. Children who have models of positive emotional expressiveness are more likely to have opportunities to learn how to manage emotional arousal within the positive emotional climate within parent-child interaction. A meta-analysis found a significant relation between positive emotional expressiveness in the family and children's positive expressiveness across age (Halberstadt & Eaton, 2002). Children's positivity may be enhanced by a positive emotional environment, and thus, they will be able to broaden their attention and build regulatory strategies.

In this study, we investigated the effects of parents' expression of positive emotion during a conversation about an upsetting event as a potential application of the undoing effect of positive emotions. Although we did not examine children's cardiovascular recovery from negative emotions, parental modeling of positive emotion during a stressful conversation might elicit children's own positive emotion and promote children's use of positive emotions to self-regulate during future stressful events. Research supports this focus on parental positive expressivity when discussing a negative event, as Liew et al. (2011) found that high levels of parents' positive expressivity during a frustrating task with children were related to children's physiological regulation when the children worked on a challenging task alone.

Theoretical work proposes that parents' emotional expression may convey different meaning to children related to their temperament (Dunsmore & Halberstadt, 1997). Thus, in the current study, we explored how preschoolers' self-regulation was associated with their temperamentally based levels of pleasure, depending on parents' positive emotional expression when discussing upsetting events. We expected that higher levels of low-intensity pleasure would be related to better regulation whereas lower levels of high-intensity pleasure would be related to better regulation only when parents were higher in positive emotion expression.

1.1.2. Parental coaching of positive emotion

In addition to modeling positive emotionality, parents may directly encourage children's experience and expression of positive emotions during frustrating or upsetting events, potentially as a way to support children's regulation of negative emotions. Parents' acceptance and direct guidance of children's emotional responses is called emotion coaching (Gottman, Katz, & Hooven, 1996), and a large body of research shows that parents' encouragement or coaching of children's negative emotions is related to children's better self-regulation (Dunsmore, Booker, & Ollendick, 2013; Eisenberg, Fabes, & Murphy, 1996; Katz, Maliken, & Stettler, 2012). Though much of the research on emotion coaching has focused on children's negative emotions, such as anger, fear, and sadness, recent research has extended this construct to coaching of positive emotions. For example, with school-age children, Yi, Gentzler, Ramsey, and Root (2016) found that children who were low in self-control had fewer externalizing behavior problems when mothers more strongly encouraged positive emotions.

As noted earlier, Diamond & Aspinwall (2003) proposed that parents' positive emotion coaching could support positive reframing and optimism, thereby helping children learn to manage frustration. When children experience parental guidance on positive reframing while facing upsetting events, they may experience the "undoing effects" of positive emotions (Fredrickson et al., 2000, p. 240). The experience of recovering from cardiovascular effects of negative emotion with the assistance of their parents may, over time, help children develop the skill of recruiting positive emotions to manage negative emotions on their own. Children's temperamental positivity may allow them to learn and internalize regulatory resources within a positive emotional environment where parents accept and teach various emotional experiences. Thus, as with parents' expression of positive emotion, we examined the moderating effect of parents' positive emotion coaching on the relation between child positivity and self-regulation. Considering different relations of high- and low-arousal positive emotions to self-regulation (Gartstein & Rothbart, 2003; Putnam et al., 2008; Stifter et al., 2008), we hypothesized that higher levels of low-intensity pleasure would be related to better regulation and lower levels of high-intensity pleasure would be related to better regulation when parents engaged in more encouragement of positive emotion.

1.2. Current study

Based on research suggesting that positive emotions facilitate building up personal resources (Basso et al., 1996; Isen, 2000; Kok et al., 2013), we explored the role of young children's positive emotions and parents' positive emotion socialization in children's self-regulation. Because the preschool developmental period is a critical stage to promote optimal regulatory strategies (Rothbart & Bates, 2006), we examined the multifaceted aspects of self-regulation (Rothbart, Sheese, & Posner, 2007) by including both parent report of effortful control and attentional distraction observed in a negative emotion-eliciting situation. Young children benefit from directing attention away from a source of frustration because doing so helps them to lower "the intake of emotionally arousing information" (Thompson, 1994, p.32), and parent report of effortful control examines self-regulation across a range of emotional contexts. We also used high-intensity and low-intensity pleasure as indices of positive emotional reactivity (Rothbart et al., 1994). We hypothesized that more low-intensity pleasure would be related to better self-regulation whereas less high-intensity pleasure would be related to better self-regulation, specifically more distraction in a negative emotion-eliciting situation and higher levels of effortful control in daily life.

With regard to parents' emotion socialization, we distinguished parents' positive emotion socialization during an emotion talk task from parents' general positive expressiveness in the family. As a reflection of parents' contribution to family emotional climate, parents' general expressiveness of emotion has been found to be associated with children's emotion understanding and self-regulation (Garner, 1995; Halberstadt, Crisp, & Eaton, 1999). To investigate potential application of the undoing effect of positive emotions during a parent-child emotion talk, we controlled for parents' general positive expressiveness in the family.

Drawing from the concept of goodness of fit (Chess & Thomas, 1991), we explored the interplay between temperamental positive emotion of children and socialization of positive emotion from parents. We examined the potential moderating effects of parents' positive emotional expression and emotion coaching during an emotion-related discussion on the relation between children's temperamental pleasure and their regulatory strategies. We hypothesized that higher levels of child low-intensity pleasure would be related to more distraction and effortful control when parents expressed more positive emotion and engaged in more encouragement of positive emotions. We also expected lower levels of child high-intensity pleasure would be related to more distraction and effortful control when parents expressed more positive emotion and engaged in more encouragement of positive emotions.

2. Method

2.1. Participants

Parents and their preschool-aged children (n = 156, 77 girls, 79 boys, M age = 4.33 years, SD = 0.77, age range 3.02 to 5.78 years) were recruited in the southeastern US to participate in a laboratory visit measuring child pleasure, child self-regulation, and parental socialization of emotions; 153 parents and children were included in analyses (3 dyads were dropped due to incomplete questionnaires). Parents (140 mothers, 9 fathers, and 4 other caregivers) identified as white (89.7%), Asian, (1/3%), Black or African American (0.6%), and other or did not report their race (8.3%). Most parents were not Hispanic or Latino (91.7%), 5.1% identified as Hispanic or Latino and 3.2% did not report their ethnicity. These demographics are representative of the region where the study was conducted (85% white non-Hispanic, 5.7% Asian, 0.4% Black or African American; US Census, 2013). The majority of parents, 90.4%, were married or living with their children's other parent. With regard to family income, 71.2% of families reported that their income was over $60,000, 14.1% in the $45,000 to $60,000 range, 6.4% in the $30,000 to $45,000 range, and 13.5% under $30,000. Most families were at or above the median family income for the state (U.S. Census Bureau, 2018). Most parents, 87.2%, had a college degree or higher; the majority, 92.9%, of parents were European American.

Participants were recruited from a database of families who previously participated in research and were interested in future research, with flyers and hand-outs in the local communities, Head Start programs, childcare centers, and other child-oriented locations, and through a purchased mailing list. After completion of the laboratory assessment, parents received a $10 gift card and children were given 2 toys.

2.2. Procedure

Interested parents were contacted with details of the study. If parents agreed to participate in the study, the Child Behavior Questionnaire–Short Form (CBQ–SF; Putnam & Rothbart, 2006) was mailed to participants. Parents were asked to bring completed questionnaires to the lab. At the beginning of the visit, parents were given information about the tasks, and parental consent and child assent were obtained. During the laboratory visit, parents and children completed a laboratory assessment, which lasted about 1.5 hours. Parents worked on more questionnaires while children completed tasks in the same room. All tasks were video recorded.

The parent-child emotion talk task (Dunsmore et al., 2013) was designed to examine emotion-related discussion of family memories. Parents picked a time when their children were happy and a time when their children were upset to discuss; events were counterbalanced. Parents were asked to select events that were not routine or repeating events (e.g., birthday parties) or events with scripts (e.g., movie). Parents and children discussed each event as they would at home for 2 minutes and thirty seconds. In this study, parents' positive emotional expression and emotion coaching during the upset event were examined.

Children completed a locked-box frustration task adapted from the Laboratory Temperament Assessment Battery–Preschool Version (Goldsmith, Reilly, Lemery, Longley, & Prescott, 1993). An experimenter brought a transparent box and 2 sets of attractive toys into the room. Children's preferred set of toys was placed in a transparent box that the experimenter locked. Children were given a set of keys and told that they could use the keys to open the lock to play with the toys; however, the correct key was not included. The experimenter left the room, saying she had to work on something in the other room, and children were left for 4 minutes to unlock the box. Parents were instructed to work on their questionnaires and tell children that they were busy if their children asked for help with the task. Then the experimenter came back to the room with the correct key, apologized for providing wrong keys, and helped the children open the box to play with the toys.

2.3. Measures

2.3.1. Child self-regulation strategies

Children's *distraction* was coded in the locked-box frustration task on a present/absent scale during 5-second epochs. Distraction was coded as present when children were focused on an object other than the locked box and keys for 2 seconds or more. A summary score was computed by averaging all epochs. To obtain reliability, at least 20% of the sample was coded independently by 2 research assistants. The intraclass correlation (ICC) was 0.97.

Parents rated children's *effortful control* using the Child Behavior Questionnaire (CBQ; Rothbart, Ahadi, Hershey, & Fisher, 2001)

on a 7-point scale (1 = *extremely untrue of my child* and 7 = *extremely true of my child*). Three scales of the CBQ were computed to create the effortful control scales: attention focusing (14 items, e.g., "When picking up toys or other jobs, usually keeps at the task until it's done"; $\alpha = 0.78$), attention shifting (12 items, e.g., "Has an easy time leaving play to come to dinner" $\alpha = 0.80$), and inhibitory control (13 items, e.g., "Can easily stop an activity when s/he is told 'no'"; $\alpha = 0.84$). Following a theoretical conceptualization of effortful control (Eisenberg et al., 2016) and correlations among the three subscales (all correlations were 0.16 or higher, $P < 0.06$), the scales were combined by averaging the subscales.

2.3.2. Child pleasure

Parents rated their children's temperamental pleasure on a 7-point scale (1 = *extremely untrue of my child* and 7 = *extremely true of my child*) using the CBQ–SF (Putnam et al., 2006). The high-intensity pleasure (6 items, e.g., "Enjoys activities such as being chased, spun around by the arms etc."; $\alpha = 0.62$) and the low-intensity pleasure subscales (6 items, e.g., "Enjoys taking warm baths."; $\alpha = 0.71$) were used. The definition of the high- and low-intensity pleasure is the "amount of pleasure or enjoyment related to situations involving high and low stimulus intensity, rate, complexity, novelty, and incongruity" (Rothbart et al., 2001, p. 1406). This scale assessed positive emotions derived from both high and low intensity stimulus (Rothbart & Ahadi, 1994). Mean scores were computed for each subscale.

2.3.3. Parents' positive emotional expression

Parents' positive emotional expression was coded during the 2.5-minute episode when parents discussed an upsetting event with their children. It was coded when a positive emotion word (e.g., happy, proud, etc.) was used to refer to parents' own emotion state or nonverbal expressions of positive emotion (e.g., smiling, laughing) were displayed. In the original coding (Dunsmore et al., 2013; Dunsmore, 2015), a score of 0 was coded when parents did not nonverbally express positive emotion or verbally refer to their own positive emotion during the discussion, a score of 1 was coded if parents nonverbally expressed positive emotion or made reference to their own positive emotions once within the discussion, and a score of 2 was coded if parents nonverbally expressed positive emotion or made reference to their own positive emotions more than once within the discussion. Parents in our sample, however, rarely expressed their own positive emotions more than once during the upset event discussion, most likely because of the young age of their children. Therefore, the scale was changed from a 3-point to a 2-point scale. Codes for parental expressions of positive emotion considered the parents' own positive affect; parent responses to children's emotions that derided children for their emotions (e.g., laughing at the child) were not coded as an expression of emotion (these behaviors were captured in the emotion coaching behavior described below). Two research assistants independently coded at least 20% of the sample to calculate reliability ($\kappa = 0.65$).

2.3.4. Parents' emotion coaching

Coding for parents' emotion coaching quantified the ways that they responded to children's verbal or nonverbal expression of positive and negative emotions during the 2.5-minute episode when parents discussed an upsetting event with their children. Only coaching of positive emotions was included in the current study. A global score was given according to the highest behavior observed on a 6-point scale. A score of 0 was coded if parents did not show any encouragement of positive emotion. A score of 1 was coded if parents acknowledged, recognized, or agreed with the child's mention of a positive fact of the event being discussed. A score of 2 was coded if the parent acknowledged, recognized, or agreed with the child's positive emotions related to the event, including verbal and nonverbal behaviors, such as mirroring the child's emotions. A score of 3 was coded if the parent labeled or validated the child's positive emotions once. A score of 4 was coded if there were multiple instances of labeling and/or validating the child's positive emotions. A score of 5 was coded if the parent discussed causes and consequences or strategies to deal with positive emotions once. A score of 6 was coded if there were multiple instances of strategy or causes and consequence discussions about positive emotions. Two research assistants each independently coded at least 20% of the sample to calculate reliability (ICC = 0.74).

3. Results

3.1. Preliminary analyses

There were three cases of missing data in the temperament questionnaires because parents did not complete it. The missing data have been removed from the following analyses. Given that the potential impact of missing data is negligible if the proportions of missing data are below 5%, (Jakobsen, Gluud, Wetterslev, & Winkel, 2017), it was acceptable to ignore missing data in the analyses. Descriptive statistics for study variables are presented in Table 1. Preliminary analyses examined if age and child sex were significantly related to any of the study variables. Older children were lower in distraction, $r(151) = -0.29$, $P < 0.01$, and received less parental positive emotion coaching, $r(151) = -0.24$, $P < 0.05$. There were significant sex differences in effortful control and child high-intensity pleasure. Girls' effortful control, $M = 4.65$, $SD = 0.53$, was higher than boys' effortful control, $M = 4.47$, $SD = 0.58$; $t(151) = -2.00$, $P < 0.05$. Child high-intensity pleasure was higher for boys, $M = 5.17$, $SD = 0.84$, than for girls, $M = 4.72$, $SD = 0.78$, $t(151) = 3.47$, $P \leq 0.01$. Because of these findings, child age and sex were controlled for in the analyses. In addition, we controlled for effects of parents' general positive expressiveness in the family as a reflection of parents' contribution to family emotional climate to distinguish between general emotional climate in the family and parents' emotion socialization during the emotion-related task.

Partial correlations, controlling for child age, sex, and general positive expressiveness in the family are reported in Table 2. Effortful control was positively correlated with children's low-intensity pleasure and parents' positive emotional expression during the upsetting event discussion and negatively correlated with children's high-intensity pleasure. No other significant associations among study variables were found.

3.2. Moderation analyses

Two hierarchical regression analyses were conducted to examine the potential moderating effect of parents' emotion socialization in the relation of children's pleasure to their self-regulation. Separate analyses were conducted to examine each dependent variable of self-regulation (i.e., distraction and effortful control). The analyses were computed in SPSS, employing the PROCESS macro version 3.5 (Hayes, 2018). Child pleasure and parents' positive emotion coaching during the upsetting event discussion were mean-centered. Control variables of child age, sex, and parents' positive expressiveness in the family were entered on the first step, child high- and low-intensity pleasure were entered on the second step, and parents' positive emotional expression and emotion coaching when discussing an upsetting event were entered on the third step. On the fourth step, the interaction terms, which were created by multiplying child pleasure and parents' emotion socialization variables, were added stepwise. Because parents' positive emotional expression during a discussion about an upsetting event

Table 1
Descriptive statistics.

	Mean	*SD*	Minimum	Maximum
Child positive emotion				
High-intensity pleasure	4.95	0.84	3.00	7.00
Low-intensity pleasure	5.78	0.72	3.50	7.00
Parents' emotion socialization				
Positive emotional expression	0.33	0.47	0.00	1.00
Positive emotion coaching	1.10	1.82	0.00	6.00
Positive expressiveness in the family	5.89	0.64	4.09	7.23
Child self-regulation				
Distraction	0.19	0.15	0.00	0.77
Effortful control	4.55	0.56	3.04	5.60

Table 2
Partial correlations of regulation strategies, child positive emotion, and parents' emotion socialization, controlling for child age, sex, and parents' positive expressiveness in the family.

	1	2	3	4	5	6
1. Child high-intensity pleasure	–	–	–	–	–	–
2. Child low-intensity pleasure	−0.01	–	–	–	–	–
3. Parents' positive emotional expression	−0.08	0.03	–	–	–	–
4. Parents' positive emotion coaching	−0.03	0.07	0.14	–	–	–
5. Distraction	0.00	−0.07	0.12	−0.05	–	–
6. Effortful control	−0.35***	0.34***	0.21**	−0.10	.03	–

Note. $^{**}P \leq 0.01$ $^{***}P \leq 0.001$.

Table 3
Regression analysis predicting children's distraction from child peasure and parents' emotion socialization.

	B	*SE*	R^2	ΔR^2
1. Child age	−0.06***	0.02	0.10	0.10**
Child sex	0.03	0.03		
Parents' positive expressiveness in the family	−0.03	0.02		
2. Child high-intensity pleasure	0.00	0.01	0.10	0.00
Child low-intensity pleasure	0.02	0.02		
3. Parents' positive emotional expression	0.05*	0.03	0.12	0.02
Parents' positive emotion coaching	−0.01	0.01		
4. Child low-intensity pleasure × Parents' positive emotional expression	−0.10	0.04	0.15	0.03*
5. Child low-intensity pleasure × Parents' positive emotion coaching	0.02*	0.01	0.17	0.02*
F for model	3.32***			

Note. The *B* values presented are the unstandardized beta values from the last step.
$P \leq 0.05$, $P \leq 0.01$, $P \leq 0.001$..

was coded as a dichotomous variable (absent or present), the interaction term was not centered and was probed following recommendations by Hayes (2018). Parents' positive emotion coaching was examined at values of 1 standard deviation above and below the mean.

3.2.1. Distraction

In the regression analysis predicting children's distraction from children's pleasure, parents' positive emotional expression during the negative event discussion with their children was positively related to children's distraction (Table 3). This main effect was qualified by a significant interaction between children's low-intensity pleasure and parents' positive emotional expression during the discussion. Cohen's effect size value ($f^2 = 0.20$) suggested a moderate practical significance. Children who were higher in low-intensity pleasure used less distraction (Fig. 1) when parents expressed positive emotions, slope = −0.07, s.e. = 0.03, $P \leq 0.05$; the association was not significant when parents did not express positive emotions, slope = 0.02, s.e.= 0.02, *ns*. Also, a moderating effect of parents' positive emotion coaching during the discussion on the relation of children's low-intensity pleasure to observed distraction was found. Children who were higher in low-intensity pleasure used more distraction (Fig. 2) when parents' positive emotion coaching was high (+1 *SD* above the mean), slope=0.05, s.e. = 0.03, $P < 0.10$, but not when parents' positive emotion coaching was low (−1 *SD* below the mean), slope = −0.01, s.e. = 0.02, *ns*.

3.2.2. Effortful control

In the regression analysis predicting children's effortful control from children's pleasure, both children's high- and low-intensity pleasure were related to their effortful control. Less high-intensity pleasure was related to more effortful control whereas more low-intensity pleasure was associated with more effortful control (Table 4). Cohen's effect size value ($f^2 = 0.45$) suggested a high practical significance. In addition, parents' positive emotion socialization during an upsetting event discussion with their children displayed different directions when predicting children's effortful control. Parents' positive emotional expression were related to more effortful control whereas more parental positive emotion coaching during the negative event discussion was related to less effortful control. However, none of the interaction terms met the criteria to be added in the stepwise analysis; therefore, there were no significant interactions between child pleasure and parents' positive emotion socialization predicting effortful control.

4. Discussion

The current study examined parental positive emotion socialization, including parental positive emotional expressions and emotion coaching of positive emotions when discussing upsetting events with children. These modes of socialization were examined as moderators of the relations of children's pleasure to 2 dimensions of children's self-regulation, observed distraction in a poten-

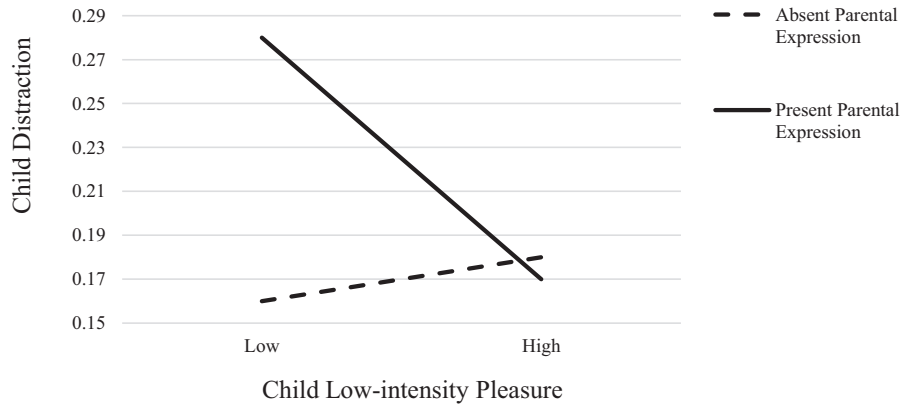

Fig. 1. Moderating effect of parents' positive emotion expression on the relation of children's low-intensity pleasure and distraction. Notes. Children's low-intensity pleasure was negatively related to children's distraction when parents' positive emotional expression was present, slope = −0.07, s.e. = 0.03, $P \leq 0.05$, but not when parents' positive emotional expression was absent, slope = 0.02, s.e. = 0.02, *ns*.

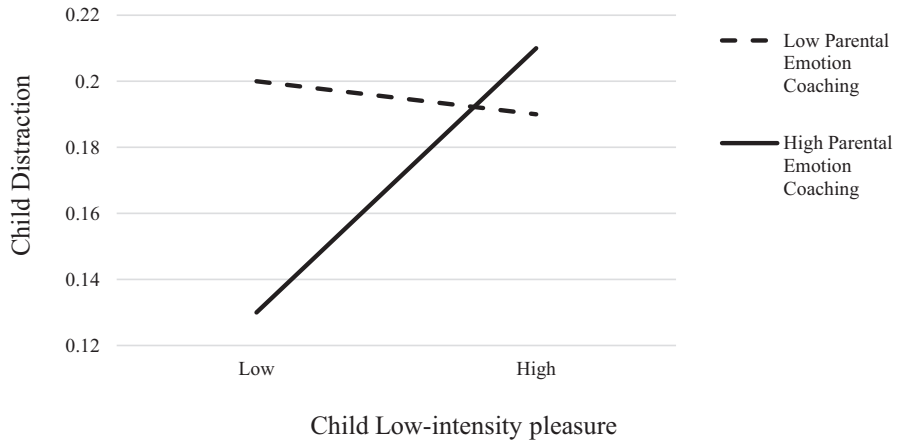

Fig. 2. Moderating effect of parents' positive emotion coaching on the relation of children's low-intensity pleasure and distraction. Notes. Children's' low-intensity pleasure was positively related to children's distraction when parents' positive emotion coaching was high (+1 *SD* above the mean), slope = 0.05, s.e. = 0.03, $P < 0.10$, but not when parents' positive emotion coaching was low (−1 *SD* below the mean), slope = −0.01, s.e. = 0.02, *ns*.

Table 4
Regression analysis predicting children's effortful control from child pleasure and parents' emotion socialization.

	B	*SE*	R^2	ΔR^2
1. Child age	−0.18	0.05	0.03	0.03
Child sex	.04	0.08		
Parents' positive expressiveness in the family	−0.10	0.06		
2. Child high-intensity pleasure	−0.23***	0.05	0.26	0.23**
Child low-intensity pleasure	0.28***	0.06		
3. Parents' positive emotional expression	0.23**	0.08	0.31	0.05**
Parents' positive emotion coaching	−0.05*	0.02		
F for model	9.26***			

Note. The *B* values presented are the unstandardized beta values from the last step.
$P \leq 0.05$, $P \leq 0.01$, $P \leq 0.001$.

tially frustrating situation and parent-reported effortful control. Accounting for parents' general positive expressiveness in the family, parents' positive emotion socialization during an emotion talk task interacted with children's pleasure when predicting children's self-regulation. Our findings suggest the role of context-specific positive emotion socialization in children's developing self-regulation and how the broaden-and-build model could be applied in parent-child interactions. Given that prior research exploring the role of positive emotion in self-regulation has been mainly focused on adult populations (Basso et al., 1996; Isen, 2000; Kok et al., 2013), we extended previous findings by demonstrating relations between positive emotions and self-regulation in early childhood.

Parents' positive emotional expression when discussing an upsetting event was positively associated with children's distraction and moderated the relation of children's low-intensity pleasure to distraction. The relations were only significant for children whose parents expressed positive emotions during a discussion of an upsetting event. When parents expressed positive emotion in these discussions, more low-intensity pleasure was associated with less use of distraction during a frustrating task. Parents' positive emotion coaching during an upsetting event discussion moderated the relation of children's low-intensity pleasure to distraction in a different direction. More low-intensity pleasure was related to more distraction only when their parents' positive emotion coaching was high. However, there were no significant interactions between children's pleasure and parents' emotion socialization practices predicting effortful control, but direct associations of pleasure to effortful control were found.

4.1. Child distraction

As expected, children higher in low-intensity pleasure showed more distraction during a frustration-eliciting task when parental emotion coaching was high. This finding suggests that parental positive emotion coaching facilitates attentional control of children with higher low-intensity pleasure, thus supporting the broaden-and-build model (Fredrickson, 2001). When both the child and parent were higher in positivity, preschool children displayed more adaptive resources to regulate frustration by shifting attention away from the source of the frustration. Positive emotions may serve to widen the breadth of children's attention and actions. This form of regulation shown by children higher in low-intensity pleasure may facilitate their acceptance of parental emotion socialization. Or, perhaps children who tend to be more tranquil and regulated notice their parents' validation and encouragement of positive emotions more during discussions of an upsetting event and recognize it as providing emotional respite from focusing on an upsetting event. Doing so might facilitate children's recognition of distraction as a regulatory strategy when experiencing negative emotions. Preschool-aged children with more low-intensity pleasure may be predisposed to both notice and accept parental coaching of positive emotions during upsetting events as a direct emotion socialization practice that encourages attending to something more pleasant while still engaging with challenging tasks. This finding expands the broaden-and-build model, demonstrating not only the effect of children's tendency to experience positive emotions but also how parents may model positive emotions in negative situations.

Significant interactions of parents' positive emotional expression with children's low-intensity pleasure predicting children's attentional distraction were contrary to our hypotheses. More low-intensity pleasure was associated with less use of distraction when parents expressed positive emotions when discussing an upsetting event. Because children who exhibit more low-intensity pleasure may be more tranquil and self-regulated, their parents' expression of positive emotion when discussing a negative event may provide cognitive stimulation rather than eliciting their emotion. The cognitive stimulation might enhance their focus on the details of upsetting situations, which could be related to less turning away from a frustrating task. Another explanation could be parental strategies that deal with frustrating situations by reframing the situation. If parents help children to reframe frustrating situations as opportunities for growth and help their children deal with frustration through emotion socialization, those children may be better at dealing with their emotions and thus might not experience as much frustration that needs to be managed. The different findings related to parental expressions of positive emotions and emotion coaching during discussions of negative events may capture different aspects of emotion socialization with regard to self-regulation in preschool-aged children.

Notably, children's high-intensity pleasure did not interact with either aspect of parental positive emotion socialization to predict their use of distraction and was not directly related to children's distraction. The lack of findings suggests that children's dispositional tendency toward high- and low-arousal positive emotions has unique relations with parents' socialization of positive emotions when predicting their attentional control. These different patterns of findings related to children's temperamental positive emotionality supports the concept of goodness of fit when children broaden and build their psychological resources. There may be bidirectional relations between children's and parents' positivity in emotion related contexts. Also, parents of children with more high-intensity pleasure may need more effort to guide their children toward managing their emotions in an adaptive way. Given the importance of self-regulation for future outcomes (Eisenberg et al., 2010; Spinrad et al., 2007), developing programs to enhance the effects of parents' positive emotion socialization in ways that fit with their children's temperament may be particularly beneficial for preschool-aged children.

4.2. Child effortful control

Children who felt more pleasure and enjoyment from low stimulus intensity and novelty had more effortful control. As mentioned earlier, this result supports previous findings that low-intensity pleasure is related to or an aspect of effortful control (Gartstein & Rothbart, 2003; Putnam et al., 2008; Rothbart et al., 2001). Children's emotional tendency to feel positive emotions from less stimulation may to lead them to prefer less overarousing or risky situations. Similarly, children whose parents rated them lower in high-intensity pleasure were also rated as higher in effortful control, again perhaps due to these children's lack of preference for highly arousing stimuli. These findings may be related to the multidimensional nature of pleasure and call attention to the need to explore the different relations that might be present depending on the facet of pleasure examined.

Given that the high-intensity pleasure subscale measured excitement and behavioral engagement to high intensity stimuli and risk-taking activities (Rothbart et al., 2001), children with more effortful control may be less likely to engage in stimulus-seeking behaviors. Alternatively, children who feel pleasure from risky activities may be less likely to control their behavior in other contexts and thus display less effortful control. Because surgency includes impulsivity, high-intensity pleasure, activity level, and reverse-coded shyness (Rothbart & Ahadi, 1994), more work to distinguish surgency from other types of positive emotion and explore the multidimensional factors of positive emotion is needed. It is also possible that different components of self-regulation indexed by effortful control and distraction lead to different relations. Effortful control includes the attentional system, inhibitory control, and behavioral control (Eisenberg et al., 2016). Given that the attentional system develops around the second year while effortful control actively develops throughout the preschool years (Ellis, Rothbart, & Posner, 2004), the capacity for effortful control during the preschool period may not be fully matured. Additionally, different ways to measure distraction and effortful control may contribute to different findings between self-regulation skills. Distraction was observed during a time of potential challenge for the children while effortful control was reported across time and likely across a range of emotional contexts. Assessing regulation skills from different time frames might capture different aspects of regulatory abilities.

More parental positive emotional expression during a discussion about an upsetting event was associated with more children's

self-regulation as indexed through effortful control. This finding suggests that parental strategies to deal with upsetting events may facilitate not only children's attentional system but also inhibitory control and behavioral control in daily life. Contrary to our hypothesis, more parental positive emotion coaching was related to less child effortful control. The different relations of parental positive emotional expression and emotion coaching to child effortful control could be related to the primary feature of each emotion socialization strategy; positive emotional expressions function as modeling whereas emotion coaching serves as teaching strategies for children. Parents' who model expressing positive emotion during a discussion of a negative event could be demonstrating more regulated behaviors themselves, which could aid in children learning effortful control.

The negative relation of parents' emotion coaching to children's effortful control may reflect parents' emotion socialization practices when responding to young children's regulatory abilities. When children were reported as low on effortful control, parents were more likely to guide and reframe children's behavior during a discussion about an upsetting event. Parents who recognize their children have lower effortful control may spend more time engaging in emotion coaching to teach their children appropriate strategies to deal with their emotions. Although the scope of the current research did not examine directionality of this relation, the relation could be explored in future work to help disentangle these complex relations.

Significant interactions between children's high- and low-intensity pleasure and parental positive emotion socialization during a discussion were not found. Perhaps the effect of temperamental pleasure was greater than the effect of parents' positive emotion socialization when predicting preschoolers' effortful control. As mentioned previously, the development of the attentional system underlies effortful control (Ellis et al., 2004); thus, parental positive emotion socialization during a discussion about an upsetting event may not effectively facilitate children's executive regulation in attentional systems, inhibitory control, and behavioral control as it enhanced children's distraction. Different components represented by effortful control and distraction and different measurement time frames may have differential relations to positive emotion.

4.3. Limitations and strengths

A potential limitation of our study is that most participants came from European American middle-class families. European American families are over-represented in developmental research and may have unique values related to emotion socialization. Qualitative research shows that African American, European American, and Lumbee American Indian parents share positive attitudes towards children's open expression of happiness. However, only European American parents stated the belief that children should move on quickly from emotions to avoid interference with decisions and daily activities (Parker et al., 2012). Interestingly, an observational study showed that European American parents coached their child's positive emotions more frequently during a storytelling task than did African American and Lumbee American Indian parents (Lozada, Halberstadt, Craig, Dennis, & Dunsmore, 2016). Perhaps European American parents coach positive emotions in part to maintain their child's engagement with tasks. From a functionalist perspective, effects of this strategy on adaptive regulation would depend on the extent to which its use fits with both immediate circumstances and long-term developmental goals (Thompson, 2011). African American parents may coach positive emotions in part to inculcate their child's love, vitality, and joy, which are integral to African American religious experiences and foster children's understanding of life as more than surviving sorrow and pain (Hecht, Collier, & Ribeau, 1993; Love, 2021). Centering Black joy is essential for antiracist educational policies and practices that recognize the full humanity of Black children (Love, 2021). Future research may reveal methods for socializing joy. It will be important for future research to include emic as well as derived etic approaches to understand how socialization of positive emotions relates to children's developing self-regulation within and across ethnoracial groups. We also note that our sample included primarily mothers, and future research will likewise be needed to test whether results generalize to other caregivers, including both fathers and teachers.

An additional limitation of our study is the correlational design. Because we do not have longitudinal data, we cannot address directionality of associations and the correlational nature of this research prevents causal interpretations of the findings. The low internal consistency of high-intensity pleasure ($\alpha = 0.62$) could be another limitation. However, alphas of at least 0.60 have been considered the threshold for acceptable internal consistency (DeVellis, 2016), and other research on the CBQ reports subscales with alphas around 0.60 (Putnam & Rothbart 2006; Putnam et al., 2008). Meaningful findings for high-intensity pleasure were still found, such as the expected inverse association with effortful control, despite the noise associated with lower internal consistency. Additionally, using mean scores of child distraction might not capture the ongoing process and effects of the self-regulation strategy during a frustration task. Measuring and analyzing trajectories of child distraction and frustration could clarify the role of distraction in children's frustration in future research.

A major strength of our research is our use of observational methods, including parent-child discourse to capture an ecologically-valid snapshot of parents' emotion socialization behaviors and a standard experimental task to reliably measure children's behavior when they are potentially frustrated. Furthermore, accounting for parents' general positive expressiveness in the family when examining relations of their positive emotion socialization during an upsetting task was a strength, as was considering the interaction of children's temperament and parent emotion socialization.

5. Conclusions

Overall, the findings from our study support the broaden-and-build model (Fredrickson, 2001) in an early childhood population, suggesting the role of parents' positive emotion socialization in children's development. Despite recent research addressing parents' socialization of positive emotions in older children and youth (Gentzler & Root, 2019; Katz et al., 2012), a gap remains regarding the effects of parents' socialization of positive emotion on self-regulation in early childhood. Therefore, this study explored how young children's positive emotions are related to their attentional control as a strategy for self-regulation through interplay with parents' positive emotion socialization. It is noteworthy that parents' socialization of positive emotions during discussion of an upsetting event interacted with children's temperamental positivity to relate to children's personal resources, including attentional control and effortful control.

Our findings inform future research exploring children's positivity and environmental factors that may improve the effect of child positivity on children's well-being. The current study advances our knowledge of children's positivity, parents' positive emotion socialization, and young children's self-regulation. Furthermore, the findings have implications for positive emotion socialization strategies for not only parents but also childcare providers and practitioners. Exploring positive emotion socialization strategies of childcare providers could inform practitioners about the benefits of a strengths-based approach on children's positive emotions. By

promoting environments to optimize children's positive emotions, children could broaden and build their resources across many different contexts and allow them to use emotions in more functional ways to achieve their goals. Positive emotional environments could encourage children to persist and discover or develop resources by buffering against feelings of emotional exhaustion (Zapf & Holz, 2006). Children who have models of positive emotional expressiveness and encourage positive reframing are more likely to have opportunities to learn how to manage emotional arousal and functionally utilize emotions within secure emotional climates. Parents and childcare providers who enhance children's positive emotions might also be supporting their self-regulation, which has long-lasting implications for children's social and emotional outcomes at later developmental periods.

Author contributions

Eunkyung Shin: Conceptualization**,** Formal analysis, Visualization, Writing - Original draft preparation. **Cynthia L. Smith:** Conceptualization, Methodology, Resources, Writing - Reviewing and Editing, Supervision, Project administration, Funding acquisition. **Diana Devine:** Formal analysis, Validation, Writing - Reviewing and Editing. **Kimberly L. Day:** Methodology, Investigation, Data Curation, Writing - Reviewing and Editing, Project administration, Funding acquisition. **Julie C. Dunsmore:** Conceptualization, Supervision, Writing - Reviewing and Editing.

Disclosures

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