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Preschool children's views on emotion regulation: Functional associations and implications for social-emotional adjustment

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Previous studies show that preschool children view negative emotions as susceptible to intentional control. However, the extent of this understanding and links with child social-emotional adjustment are poorly understood. To examine this, 62 3- and 4-year-olds were presented with puppet scenarios in which characters experienced anger, sadness, and fear. Forty-seven adults were presented with a parallel questionnaire. Participants rated the degree to which six emotion-regulation strategies were effective in decreasing negative emotions. Results showed that even the youngest preschoolers viewed cognitive and behavioral distraction and repairing the situation as relatively effective; compared to adults, however, preschoolers favored relatively "ineffective" strategies such as venting and rumination. Children also showed a functional view of emotion regulation; that effective strategies depend on the emotion being regulated. All participants favored repairing a negative situation to reduce anger and behavioral distraction to reduce sadness and fear. Finally, the more children indicated that venting would reduce negative emotions, the lower their maternal report of social skills. Findings are discussed in terms of functional emotion theory and implications of emotion-regulation understanding for child adjustment.

Keywords: childhood development; emotion; emotion regulation; knowledge; preschoolers

Beginning around 2 years of age, children show insights into how emotions influence their own and others' behavior (Bartsch & Wellman, 1995; Dunn & Brown, 1991; Harris, 1994; Stein & Levine, 1989). Mature awareness of emotions also includes the recognition that emotions are internal states that can be intentionally modified – in other words, that negative emotions such as sadness can be purposefully changed by using emotion-regulation strategies (Astington, Harris, & Olson, 1988; Denham, 1998; Denham & Kochanoff, 2002a, 2002b; Wellman, 1992). This understanding may be important not only in terms of children's cognitive development, but also because the ability to reflect on emotion regulation may bolster a child's capacity to cope with social-emotional challenges (Denham, 1998; Lemerise & Arsenio, 2000; Saarni, 1997). Few studies, however, have examined young children's views about emotion regulation or their associations with child adjustment.

Functional emotion theory, which describes how emotions create action tendencies for behaviors that serve to cope with challenges in the environment, provides a useful framework for understanding children's views of emotion regulation (Campos, Campos, & Barrett, 1989; Frijda, 1986). The functional link between emotion and behavior may be reflected in what individuals view as effective strategies to regulate specific emotions (Reijntjes, Stegge, Terwogt, & Hurkens, 2007; Saarni, 1997). With the exception of a handful of studies with older children (Saarni, 1997), however, few studies have examined young children's functional views about emotion regulation. The preschool period in particular is an important developmental period in which to assess this issue, because it is characterized by substantial changes in children's explicit

insights into the nature of emotion and the links between psychological states and external behavior (Baird & Moses, 2001; Gopnik, Slaughter, & Meltzoff, 1994; Leslie, 1994; Wellman, Cross, & Watson, 2001). Language and cognitive limitations, however, make assessment of preschoolers' emotion understanding challenging. The present study reduced verbal and cognitive demands by using a puppet procedure to assess 3- and 4-year-old children's views about effective ways to control anger, sadness, and fear. It also examined whether this understanding reflected functional views of emotion and whether it was associated with child social-emotional adjustment.

Children's understanding of emotion regulation

Adults view emotions as modifiable to varying degrees and may evidence individual differences in their preferred strategies to modify negative emotions (Carver, Scheier, & Weintraub, 1989; Gross & John, 2003). The "Ways of Coping" model (Lazarus & Folkman, 1987) distinguishes between two basic categories of adult emotion-regulation strategies: "emotion-focused" in which effort is directed internally towards improving the negative emotional state itself (e.g., turning attention away from negative feelings); and "problem-focused" in which effort is directed externally towards improving an undesired circumstance (e.g., cleaning up a mess). These same coping strategies have been examined in young children (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Gunnar, 1994), along with less cognitively sophisticated examples of regulatory efforts, such as seeking support and

soothing from others. More cognitively complex attempts to reduce negative emotions and problem solve emerge more fully in middle childhood, with language and representational development. In addition, Compas and colleagues have suggested that the broad emotion- and problem-focused distinctions can be further broken down into strategies that engage with a stressor and those that serve to disengage from a stressor (Compas et al., 2001; Langrock, Compas, Keller, Merchant, & Copeland, 2002).

By elementary school, children recognize that both emotion- and problem-focused strategies can be used to cope with, engage with, and disengage from situations like everyday stress (Band & Weisz, 1988; Denham, 1997; Masters, Ford, & Arend, 1983; McCoy & Masters, 1990; Rossman, 1992). Although preschoolers appear to recognize that it is better to "do something" rather than "do nothing" about a situation that feels bad (Banerjee, 1992), and that parents can initiate actions that serve to reduce negative emotions (Denham, 1997), it is unclear what they understand about a broader range of emotion-regulation strategies. In particular, there are inconsistent findings on young children's awareness of emotion-focused strategies like cognitive distraction, which involves disengagement from a stressor. For example, when asked to generate ideas about what a child could do to feel happy instead of neutral, one study showed that 5-year-olds failed to spontaneously generate emotion-focused strategies (Flavell, Flavell, & Green, 2001), and another showed that 3- to 5-year-olds denied that a child could instantly shift from sadness to happiness "right now, just by thinking about it" (Kalish, 1997). On the other hand, there is suggestive evidence that, when verbal demands are reduced or when preschool children are asked about stopping negative emotions, they not only realize that actions can change negative situations and feelings over time (Dunn, 1995; Wellman, 1992), but also can recognize or generate a range of emotion-focused strategies (Denham, 1998; Hickling & Belter, 1999; Saarni, 1997). Despite these indications of competence, it still remains unclear whether young children recognize the usefulness of emotion-focused strategies. Understanding cognitive distraction – for example, the idea that one can control thoughts in order to control emotions – may require a level of meta-representational insight into mental states that is only attained during the later preschool years (Wellman et al., 2001). In consequence, it may be that only older preschoolers have insights into or preferences for this kind of mentalistic emotion-focused strategy or that assessment of young children must reduce verbal and cognitive demands in order to prevent underestimating children's understanding.

Beyond the age differences that might be expected in young children's views of emotion-focused strategies, another area worthy of further exploration is whether there are gender differences that prefigure some of the gender differences found later in development (Denham et al., 2002; Maccoby, 1998). Studies with school-age children have found that girls tend to endorse effective emotion-focused strategies, and boys endorse effective problem-focused strategies (Brenner & Salovey, 1997; Dise-Lewis, 1988; Ptacek, Smith, & Zanas, 1992). Because very early socialization of girls may favor emotion-focused strategies like suppression of anger (Malatesta & Haviland, 1982; Smetana, 1989), one prediction is that, even early on, females may display enhanced understanding of emotion-focused strategies (Zahn-Waxler, 1993).

The functional view of emotion regulation

According to functional emotion theory, emotion is inextricably linked to regulatory behaviors because discrete emotions involve unique patterns of situational appraisal and action readiness (Campos et al., 1989; Frijda, 1986; Saarni, 1997). In other words, there are "emotion scripts" for links between emotional situations and behaviors that are likely, appropriate, and effective (Saarni, 1997). For example, anger involves the appraisal that goals are blocked, hence a readiness to make problem-focused changes in the situation in order to overcome obstacles. Sadness and fear involve the appraisal of loss and threat, respectively. Therefore, children's intuitions about effective strategies may strongly depend on the emotion being experienced. For example, problem-focused strategies might be considered more appropriate or effective for situations in which there is an anger-inducing obstacle or injustice, but relatively inappropriate or ineffective for fear. One study reported that school-age children showed such intuitions: they were more likely to endorse problem-focused strategies to cope with anger, and emotion-focused strategies to cope with sadness, and both types of strategies to cope with fear (Saarni, 1997). Research on this topic is rare, however, and has never to our knowledge been conducted with preschoolers.

Associations with social-emotional adjustment

Does what children know about emotion regulation have implications for how they handle social-emotional challenges? Children who explicitly understand effective ways to regulate emotions arguably should be able to apply that knowledge to situations that require social skills, persistence, inhibition of desires, and control of emotional distress. In a study of 10- to 13-year-olds, for example, children who showed elevated signs of depression were more likely than children who showed few signs to endorse strategies that were negative, passive, or avoidant, and anticipated that all strategies would be relatively ineffective in enhancing positive mood (Reijntjes et al., 2007). The delay of gratification literature suggests that, whether or not they explicitly understand cognitive distraction as an emotion-regulation strategy, children who use distraction techniques to control behavior and negative emotions during delay of gratification tasks are better able to comply, wait, and resist temptation (Cole, 1986; Putnam, Spritz, & Stifter, 2002), and show better parent-reported ability to manage negative emotions during adolescence (Shoda, Mischel, & Peake, 1990). In a study of offspring of depressed parents, children who actually used emotion-focused strategies like distraction and positive thinking showed fewer signs of emotional and behavioral problems than those who tended to show involuntary engagement responses like rumination and intrusive thoughts (Langrock et al., 2002). Few studies have examined associations between understanding and utilizing cognitive and behavioral distraction, although one study showed that preschoolers who recognized more emotion-regulation strategies that were judged a priori as more effective, persisted more during a frustrating challenge (Cole, Dennis, Smith-Simon, & Cohen, in press).

The present study

Prior studies of preschoolers' emotion-regulation understanding provide tentative evidence that young children report that negative emotions decrease following the enactment of general regulatory strategies. Several points of clarification remain, however, including whether preschoolers understand emotion-focused strategies such as distraction, whether children's views of effective strategies depend on the emotion being controlled, and whether child understanding is linked to the ability to cope with social-emotional challenges (Banerjee, 1992; Flavell et al., 2001; Hickling & Belter, 1999; Kalish, 1997; Saarni, 1997). The present study addressed these issues and, in order to reduce verbal demands and capitalize on young children's facility with pretend play, adopted a puppet procedure. This was based on previous procedures that minimized verbal demands by allowing non-verbal answers and reduced memory requirements by creating an engaging but simple puppet play (Denham & Couchoud, 1990a, 1990b; Eder, 1990; Measelle, Ablow, Cowan, & Cowan, 1998). Children were presented with scenarios in which puppets became mad, sad, or scared, but needed to stop feeling these negative emotions. After each story children were then asked to rate three pairs of different emotion-regulation strategies. Each pair included what the emotion-regulation literature suggests is a relatively effective or ineffective emotion- or problem-focused strategy (Cole, Martin, & Dennis, 2004). These were mentalistic emotion-focused (cognitive distraction versus rumination), behavioral emotion-focused (behavioral distraction versus venting), and problem-focused (repairing a negative situation versus involving mother by calling for her with no clear plan to remedy the problem). Children provided their answers using a rating scale to indicate whether using specific strategies would influence the intensity of the negative emotion (no change in negative emotion, reduced negative emotion, or a shift to neutral or positive emotion). Rating scales have been adapted for use with preschool children over a range of tasks, from rating personal beliefs (Evans, 2001) to self-assessments of pain (Wong & Baker, 1988). Compared to forced-choice methods, this rating scale provides a more nuanced measure of the degree to which children view emotion-regulation strategies as effective (Reijntjes et al., 2007) and is consistent with theoretical and behavioral research on emotion regulation (Buss & Goldsmith, 1998; Cole et al., 2004).

Preschoolers' answers were compared to those of adults. Although there is no "gold standard" for correct or effective emotion-regulation strategies, individual preferences expressed by adults are useful comparison points from which to interpret children's preferences (Carver et al., 1989; Gross & John, 2003; Lazarus & Folkman, 1987). Since adults presumably have more extensive experience with emotion regulation, their views on effective strategies provide one basis for evaluating child views.

Given previous suggestive evidence that children as young as preschool age can recognize effective emotion-regulation strategies (e.g., Denham, 1998; Dunn, 1995; Saarni, 1997), it was predicted that: (a) preschoolers would report that strategies suggested by the literature as relatively effective versus ineffective result in greater reductions in negative emotions; (b) age and gender differences in views on effective strategies would emerge: adults would be more likely to distinguish between effective and ineffective strategies and prefer more mentalistic strategies like cognitive distraction; females would prefer

emotion-focused strategies; and boys would prefer problem-focused strategies; (c) consistent with functional emotion theory, problem-focused strategies would be viewed as most effective for reducing anger, and emotion-focused strategies would be viewed as most effective for reducing sadness and fear; and (d) relatively "effective" versus "ineffective" strategies would be associated with enhanced social-emotional adjustment (maternal report of social skills, and observed persistence and delay of gratification).

Method

Participants

Child participants were recruited through fliers sent to preschools in New York City, in particular the boroughs of Manhattan and Queens. Interested parents contacted the laboratory. Adult participants were recruited from an introductory psychology course offered at a college in Manhattan. There were a total of 109 participants: 62 children, including 40 3-year-olds (22 females) and 22 4-year-olds (11 females), and 47 adults (36 females). Of the child participants, approximately half (28) were reported by mothers as being Caucasian, and the remaining as being Hispanic, African-American, and "other" ethnicities. Mean family income ranged quite widely: $M = \$107,276$, $SD = 86,136$, median income = $\$87,500$, ranging from $\$10,400$ to $\$500,000$. Of the 47 adult participants, 18 were Caucasian, 13 were Asian-American, and the remaining 16 were Hispanic, African-American, and "other" ethnicities. As students, most reported no income. Mean ages were: 43 months, $SD = 4$ months (3 years), 54 months, $SD = 3$ months (4 years), and 22 years, $SD = 6$ years (adults). No ethnicity-group differences in study variables emerged.

Materials and procedure

Mothers brought their preschool children to the laboratory. Each preschooler spent approximately two hours in the lab as part of a larger study of children's emotional development. Assessments included several emotionally challenging tasks, a computer-based attention task, three inhibitory control tasks, two relief tasks (play and a bubbles task), and the puppet procedure. Child participants completed the tasks in the same order. Three breaks were provided: a snack, bathroom break, and an optional rest period with the mother. All children completed the entire set of assessments.

Adult participants spent approximately 30 minutes in the laboratory. They independently filled out a questionnaire containing items that mirrored those administered to preschoolers. Questions were not altered, but adults were instructed, "These scenarios have been designed for young children, but answer in the way that is most true for you as an adult."

Puppet procedure. This 30-minute procedure occurred during the second hour of the lab visit. It began with a warm-up period during which the children were encouraged to interact with the puppets, and were instructed on how to indicate changes in emotion on a 0 to 3 scale: no change, a little change, change to neutral, and change to happy. The starting point of extreme negativity (characters were very sad, fearful, angry) was established by the vignette so that the rating options were

no change versus degrees of decrease in negative emotion. The scales consisted of four black and white line-drawn faces for each emotion type (mad, sad, and scared). For example, mad faces were "very mad" (a large frown, eyes wide with eyebrows glowering), "a little mad" (a small frown, with slightly downturned eyebrows), "just OK" (mouth and eyebrows straight, no apparent expression) and "happy" (a smiling face). Answers other than very mad/sad/scared indicate that the strategy reduced the intensity of the negative emotion. Once children had been taught to identify the feelings that corresponded with each face, they were asked to generate these associations themselves. If they were not able to, they were prompted and the experimenter described situations that might make children feel each way until they correctly pointed out which pictures indicated "little" or "big" feelings, just OK, or happy. All children demonstrated understanding of these faces.

Three cloth animal puppets (dog, turtle, and cow) were used to enact the vignettes and to facilitate distinctions among characters. The dog and turtle were portrayed as siblings and the cow as the mother during each of the vignettes. The cow puppet stayed off to the side so that there was a mother figure for the "child" puppets to call on. Piloting revealed that more than three puppet scenarios was overtaxing to young children's attention, so only three vignettes (one per emotion type) were used. These described scenarios in which dog and turtle become angry, sad, and fearful. To encourage children's engagement in the stories, children were asked to interact with the puppets during the vignettes (e.g., answering the puppets' questions). One research assistant sat on the floor across from the child and was the puppeteer, acting out the puppet show on a child-sized table. A second assistant sat next to the child, helping the child understand the story and the instructions. A third assistant videotaped the procedure from behind a one-way mirror.

In each story, the reasons for the puppets' emotions and the reason they needed to "stop feeling so mad/sad/scared" were enacted for the child (see Appendix for full scripts). Each vignette ended with the puppets directly asking, "[Child's name], what can we do to stop feeling so [target emotion]?" The experimenter then said, "Let's see, [Child's name], dog and turtle feel [target emotion]. Can dog and turtle stop feeling so [target emotion] and feel good in a little while?" The experimenter then invited each of the puppets to describe a possible strategy to help stop feeling the emotion. Each puppet verbalized a strategy and acted it out. For each strategy, the child was asked to indicate how the puppet would feel after each strategy (see Appendix for a list of strategies). The child could respond by speaking or pointing to the faces comprising the rating scale. Strategies included two mentalistic emotion-focused strategies (cognitive distraction, which is disengaging or switching one's attention to pleasant thoughts, and rumination, which is engaging or focusing on how badly one feels), two behavioral emotion-focused strategies (behavioral distraction, which is doing something else, and venting, which is expressing and engaging with the felt emotion), and two problem-focused strategies (repairing the situation, which is taking socially appropriate actions to make a negative situation better, and telling mother, which is calling the mother to intervene as if "tattling" or seeking social support in a relatively unfocused way – that is, just yelling "mom!"). The puppet that suggested each type of strategy was counterbalanced between subjects. Preschoolers and adults received three vignettes, counterbalanced across subjects for the order of each emotion scenario and strategy.

Child social-emotional adjustment

Persistence. The Impossibly Perfect Circles (IPC) task was designed to elicit frustration and provide the opportunity to observe child persistence in response to adult negative feedback (Goldsmith & Rothbart, 1996). For three minutes, the experimenter repeatedly asked the child to draw a "perfect" circle, and critiqued every circle for its imperfections. Critiques were specific, but did not include information on how to rectify the problem (e.g., "That one is too flat"). After the final circle was drawn, the experimenter deemed it a success, praised the child, and gave the child a certificate. Persistence was rated on a 4-point scale: 0 – gives up totally, clear resignation; 1 – continues to work, but without interest, often averting gaze away from task; 2 – mixed behavior, keeps focused on task but periodically averts gaze; 3 – totally focused on task, expresses interest. Average persistence was, $M = 1.99$, $SD = 1.03$. Two coders were trained until they reached 85% agreement. Reliability was then calculated based on 25% of the videotapes, randomly chosen, and reflected excellent agreement (average measure intraclass correlation $r = .95$, Kappa coefficient $k = .90$).

Delay of gratification. Delay of gratification was measured during a snack delay (Goldsmith & Rothbart, 1996). Children were given the choice of two snacks (Teddy Grahams or raisins). Then, for six trials, the snack was placed under a clear plastic cup. The child was told that he or she must wait until the experimenter rung a bell to pick up the cup to get the snack. Trials included an increasingly long delay, up to 30 seconds, with two trials of no delay (trials 3 and 5). If the child did not wait for the bell or ate the snack early, the experimenter rang the bell after the pause was complete. Directions were repeated once during the task. The task was scored for the percentage of trials during which the children successfully waited (out of six) and the percentage of trials during which children showed inhibitory control by *not* prompting the experimenter (e.g., asking if they could have the snack, asking how much longer they would have to wait). The wait score showed a restricted range, with only five of the 62 children waiting for fewer than five out of six trials, $M\%$ trials successfully waited = 95, $SD = 12$. This suggests that most children could successfully wait for up to 30 seconds. In contrast, the prompt score showed greater variability: $M\%$ trials did not prompt = 75, $SD = 27$. Therefore, this score was used in subsequent analyses.

Social skills. The Social Skills Rating System (SSRS) (Gresham & Elliott, 1990) is a 49-item maternal-report measure designed to assess social skills and problem behaviors in normal and clinical populations. The SSRS yields a summary score for social skills (reflecting cooperation, assertion, responsibility, and self-control) and scores for internalizing and externalizing problems. Each scale is calculated by summing frequency ratings across constituent items (0 – never; 1 – sometimes; 2 – very often). The social skills scale is derived from 40 items, such as "helps with household tasks without being asked," and "follows household rules." Externalizing is derived from six items (e.g., has temper tantrums; is aggressive toward people or objects) and internalizing is derived from four items (e.g., says nobody likes him or her; acts sad or depressed). The means, standard deviations, and internal consistencies for each scale were: social skills $M = 53.16$,

$SD = 9.46$, $\alpha = .86$ (highest possible score = 80); externalizing $M = 4.47$, $SD = 2.45$, $\alpha = .81$ (highest possible score = 12); and internalizing $M = 1.07$, $SD = 1.28$, $\alpha = .55$ (highest possible score = 8). Because of the low base rates of externalizing and internalizing problems, these scales were not used in the present study.

Results

Means and standard deviations for emotion-change scores are presented in Table 1. As seen in Table 2, correlations among emotion-change scores suggest that a priori “effective” strategies (cognitive distraction, behavioral distraction, and repair) were positively intercorrelated with each other, as were “ineffective” strategies. In addition, each pair of relatively “effective” and “ineffective” strategies (cognitive distraction with rumination, behavioral distraction with venting, and repair with telling) were significantly positively intercorrelated, suggesting that participants may have viewed each pair of strategies as a “type” of emotion regulation. Interestingly, when correlations were run separately for children versus adults, only children showed this pattern of strong positive intercorrelations, suggesting that adults’ views about effective strategies might be more specific or differentiated than those of children.

“Effective” versus “ineffective” strategies: Age effects

To examine children’s insights into effective emotion-regulation strategies, a 2 (Gender) \times 3 (Age) \times 6 (Strategy) repeated-measures MANOVA was conducted. The six dependent variables were the emotion-change scores following each of the six strategy types averaged across emotions, with higher numbers indicating greater decreases in negativity (from 0–3, indicating no change, a little less negative, change to neutral, change to happy). It was predicted that cognitive distraction, behavioral distraction, and repair would be considered relatively effective strategies compared to rumination, venting, and telling mother. It was also predicted that adults would be more likely to make these distinctions, particularly for mentalistic strategies like cognitive distraction.

Table 1

Descriptive statistics for emotion-change scores for each strategy by emotion, age, and child gender

	<i>Mad</i>					<i>Sad</i>					<i>Scared</i>				
	3	4	Adult	Boys	Girls	3	4	Adult	Boys	Girls	3	4	Adult	Boys	Girls
Cognitive distraction	2.33 (0.94)	2.14 (0.94)	1.53 (0.80)	2.07 (1.10)	2.42 (0.75)	1.95 (1.26)	1.68 (1.21)	1.23 (0.67)	1.79 (1.29)	1.91 (1.21)	1.95 (1.30)	1.59 (1.30)	1.58 (0.77)	1.66 (1.37)	1.97 (1.24)
Behavioral distraction	2.05 (1.18)	2.00 (1.02)	2.17 (0.67)	2.21 (1.08)	1.88 (1.14)	2.03 (1.19)	1.96 (1.17)	1.70 (0.78)	1.90 (1.29)	2.09 (1.07)	1.93 (1.21)	2.18 (1.05)	2.11 (0.76)	1.86 (1.27)	2.15 (1.03)
Repair	2.45 (0.88)	2.32 (1.00)	2.47 (0.66)	2.31 (1.00)	2.49 (0.84)	2.03 (1.25)	2.09 (1.02)	2.17 (0.87)	1.93 (1.25)	2.10 (1.08)	1.75 (1.21)	2.23 (1.02)	1.72 (0.80)	1.79 (1.24)	2.03 (1.10)
Ruminate	1.67 (1.33)	1.41 (1.40)	0.55 (0.69)	1.52 (1.46)	1.64 (1.27)	1.63 (1.37)	1.36 (1.33)	0.28 (0.58)	1.55 (1.43)	1.52 (1.30)	1.03 (1.31)	0.76 (1.22)	0.28 (0.58)	0.86 (1.33)	1.00 (1.25)
Vent	1.65 (1.27)	1.41 (1.30)	0.44 (0.75)	1.62 (1.35)	1.52 (1.23)	1.48 (1.20)	1.05 (1.21)	0.28 (0.65)	1.41 (1.32)	1.24 (1.12)	1.28 (1.30)	1.05 (1.20)	0.28 (0.58)	1.21 (1.34)	1.18 (1.21)
Tell	1.45 (1.26)	1.86 (1.21)	1.21 (1.00)	1.38 (1.35)	1.79 (1.14)	1.90 (1.24)	1.55 (1.32)	1.32 (0.86)	1.85 (1.38)	1.73 (1.18)	1.50 (1.34)	1.73 (1.28)	1.58 (0.95)	1.66 (1.37)	1.52 (1.28)

Note. Values are means and standard deviations in parentheses. Rating from 0 to 3: no change, a little change, change to neutral, and change to happy.

Table 2

Correlations among strategy ratings

	1	2	3	4	5	6
Total sample ($N = 109$)						
1. Cognitive distraction	—	.42***	.42***	.44***	.39***	.14
2. Behavioral distraction		—	.37***	.17	.21*	.16
3. Repair			—	.06	.11	.31**
4. Ruminate				—	.72***	.43***
5. Vent					—	.37***
6. Tell						—
Children ($N = 62$)						
1. Cognitive distraction	—	.36**	.50***	.42**	.34**	.17
2. Behavioral distraction		—	.43**	.28*	.29*	.29*
3. Repair			—	.17	.29*	.33**
4. Ruminate				—	.65***	.55***
5. Vent					—	.51***
6. Tell						—
Adults ($N = 47$)						
1. Cognitive distraction	—	.70***	.28	-.10	-.07	-.08
2. Behavioral distraction		—	.23	-.10	.09	-.13
3. Repair			—	-.27	-.46**	.27
4. Ruminate				—	.45**	.10
5. Vent					—	-.12
6. Tell						—

* $p < .05$; ** $p < .01$; *** $p < .001$.

This MANOVA yielded a multivariate Age \times Strategy interaction, $F(10,200) = 4.21$, $p < .001$, partial $\eta^2 = .17$. Overall, as predicted, children and adults considered cognitive distraction to be more effective than rumination in reducing negative emotions, $F(1,103) = 77.21$, $p < .001$, partial $\eta^2 = .43$, behavioral distraction more effective than venting, $F(1,103) = 120.04$, $p < .001$, partial $\eta^2 = .54$, and repair more effective than telling mother, $F(1,103) = 37.52$, $p < .001$, partial $\eta^2 = .27$. However, when cognitive distraction was compared to rumination, $F(2,103) = 4.59$, $p < .05$, partial $\eta^2 = .08$, Age effects emerged: preschoolers were more likely than adults to view both cognitive distraction and rumination as leading to greater decreases in negative emotions, both $ps < .05$. When behavioral distraction was compared to venting, $F(2,103) = 17.16$, $p < .001$, partial $\eta^2 = .25$, preschoolers and adults were

equally likely to consider behavioral distraction as an effective way of reducing negative emotion, and more effective than venting, all $ps < .001$, but 3- and 4-year-olds compared to adults gave higher ratings to venting as a way of decreasing negative emotions, both $ps < .001$. No significant Age \times Strategy effects emerged for repair versus telling.

In summary, across all ages, cognitive distraction, behavioral distraction, and repair were considered relatively effective compared to their relatively ineffective emotion- and problem-focused counterparts. Children compared to adults showed enhanced endorsement of relatively ineffective rumination and venting. No gender effects emerged.

"Effective" strategies: Emotion-specific effects

Next, "effective" strategies were compared to test emotion-related hypotheses using a 3 (Age) \times 3 (Emotion) \times 3 (Strategy) repeated measure MANOVA. The nine dependent variables were cognitive distraction, behavioral distraction, and repair for each of the three emotion vignettes. It was examined whether females would be more likely than males to prefer emotion-focused strategies (cognitive and behavioral distraction) and whether adults and older children compared to younger children would prefer mentalistic strategies like cognitive distraction.

A main effect of Gender emerged, $F(1,103) = 4.61, p < .05$, partial $\eta^2 = .05$, showing that females versus males endorsed greater emotion change across all strategies and emotions ($M = 2.12$ versus $M = 1.89$). The main effect of Strategy, $F(2,102) = 10.58, p < .001$, partial $\eta^2 = .17$, revealed that, overall, cognitive distraction was considered less effective than both behavioral distraction and repairing the situation, both $ps < .001$ ($Ms = 1.80, 2.05, \text{ and } 2.13$, respectively). However, Strategy interacted with Age, $F(4,204) = 4.37, p < .01$, partial $\eta^2 = .08$: 3-year-olds showed no preferences; 4-year-olds considered cognitive distraction to be less effective than repair, $t(21) = -2.81, p < .01$; and, counter to predictions, adults considered cognitive distraction to be less effective than both

behavioral distraction and repair, $t(46) = -8.31, p < .001$ and $t(46) = -6.46, p < .001$, respectively. Like correlation analyses reported above, this suggests increased differentiation among strategies with age.

Between-age effects also emerged consistent with those reported above: 3- and 4-year-olds endorsed distraction and the three relatively "ineffective" strategies (ruminate, vent, tell mother) as resulting in more emotion change than indicated by adults, all $ps < .01$. Three- and 4-year-olds did not differ in emotion-change scores for any of the strategies.

The Strategy \times Emotion interaction suggested that distinct effective strategies were preferred for each negative emotion, $F(4,100) = 2.50, p < .05$, partial $\eta^2 = .09$. It was predicted that repair would be viewed as most effective for reducing anger and that emotion-focused distraction (both mentalistic and behavioral) would be seen as most effective for reducing sadness and fear. Consistent with this, Figure 1 shows that repair was endorsed as more effective than cognitive and behavioral distraction for reducing anger, $t(108) = 4.35, p < .01$ and $t(108) = 3.24, p < .01$, and was endorsed as more effective for anger compared to sadness and fear, $t(108) = 2.60, p < .01$ and $t(108) = 5.46, p < .001$. Behavioral distraction and repair were considered more effective than cognitive distraction for reducing sadness, $t(108) = 2.63, p < .01$ and $t(108) = 3.99, p < .001$, and behavioral distraction was considered more effective than cognitive distraction for reducing fear, $t(108) = 2.85, p < .01$. Although cognitive distraction was not preferentially endorsed for any one emotion, it was considered relatively effective for reducing anger versus sadness, $t(108) = 3.22, p < .01$.

Relatively "ineffective" strategies

Because children endorsed relatively "ineffective" strategies as resulting in greater emotion change than adults, it was of interest to examine whether age and emotional context influenced endorsement of ineffective strategies. Therefore, a 3 (Age) \times 3 (Emotion) \times 3 (Strategy) repeated measure

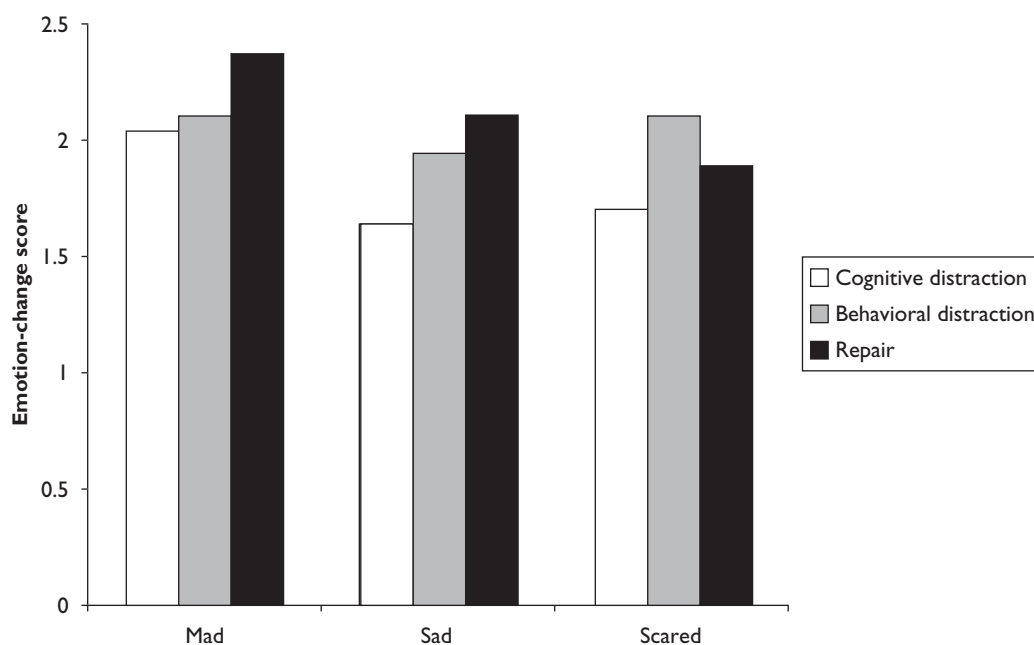


Figure 1. Average emotion-change scores (decreased negative emotion) for relatively effective strategies.

MANOVA was conducted using only the “ineffective” strategies ruminate, vent, and telling mother.

The significant Strategy \times Age effect, $F(4,204) = 3.04$, $p < .05$, partial $\eta^2 = .06$, showed that preschoolers compared to adults viewed rumination and venting, but not telling mother, as resulting in greater emotional change, all $ps < .01$; on the other hand, 4-year-olds and adults indicated that telling mother would result in more emotional change compared to rumination or venting, all $ps < .001$. Three-year-olds did not differentiate among strategies in this way.

The significant Strategy \times Emotion interaction, $F(4,100) = 4.73$, $p < .01$, partial $\eta^2 = .16$, further showed that telling mother was considered the most effective strategy for each emotion, all $ps < .001$; that rumination was endorsed as less effective in reducing fear compared to anger and sadness, both $ps < .01$; and that venting was viewed as more effective for reducing anger compared to sadness and fear, $ps < .05$. Therefore, emotion-change scores varied among “ineffective” strategies as they did among “effective” strategies.

Correlations between emotion-regulation understanding and social-emotional adjustment

Findings thus far suggest that children preferentially endorsed a priori effective emotion-regulation strategies. Because children also endorsed relatively ineffective strategies more often than adults, however, their intuitions about emotion regulation were not yet “adult-like.” If children’s views on effective strategies (cognitive distraction, behavioral distraction, and repair) were associated with greater social-emotional adjustment and ineffective strategies with reduced adjustment, this would strengthen the inference that findings reported above reflect meaningful individual differences in child emotional understanding rather than over-attribution of change. To test this, emotion-change scores for each strategy were summed across emotions (fear, sad, and anger scenarios). Correlations between these six scores and adjustment measures (persistence, delay of gratification, and social skills) were conducted. One significant correlation emerged: the more children indicated that venting would reduce negative emotions, the lower the maternal report of social skills ($r(62) = -.26$, $p < .05$).

When correlations were conducted for each emotion- \times strategy-change score, several significant correlations emerged, but mainly for fear. The more children indicated that repair reduces fear, the greater their ability to delay gratification ($r(62) = .34$, $p < .01$). In contrast, the more children indicated that venting and telling reduce fear, the lower the maternal report of social skills ($r(62) = -.30$, $p < .01$ and $r(62) = -.31$, $p < .01$, respectively). One marginally significant correlation emerged for sadness. The more children indicated that rumination reduces sadness, the less they persisted ($r(62) = -.25$, $p = .06$).

Discussion

Although emotions at times elude our attempts to control them, mature emotion understanding includes the knowledge that emotions can be intentionally modified and that there are behavioral and cognitive strategies to do so. Prior research on emotion-regulation understanding has focused almost exclusively on school-aged children and has demonstrated that, by

middle childhood, children recognize that problem-focused and emotion-focused strategies can reduce negative emotional experiences (Saarni, 1997). To date, however, there has been little work on preschool children’s grasp of whether emotions can be controlled and even less detailed research on young children’s insights into functional links between emotions and strategies. The present study demonstrated that, when age-appropriate methods are used, even very young preschoolers can express their views about effective emotion-regulation strategies and the functional link between distinct negative emotions and specific strategies. This understanding showed links to independent measures of social-emotional adjustment, suggesting that this study’s assessment captured meaningful individual differences.

Preschool children appeared to have a substantial amount of explicit knowledge regarding emotion-regulation strategies. Like adults, preschool children confirmed our a priori distinctions between relatively effective and ineffective strategies: cognitive and behavioral distraction and repairing the situation were associated with greater decreases in negative emotions compared to their relatively ineffective counterparts (rumination, venting, and telling mother). In particular, all age groups indicated that one of the best ways to stop feeling badly is to repair the negative situation, and preschoolers and adults endorsed cognitive and behavioral distraction at comparable rates. This contrasts with previous findings that young children are uncertain about the effectiveness of distraction (Kalish, 1997) and implies that, when cognitive and verbal demands of a task are reduced, children demonstrate more extensive understanding of mentalistic strategies than is typically reported (Hala, Chandler, & Fritz, 1991).

Although preschoolers and adults recognized that emotions could be regulated via cognitive emotion-focused strategies, they viewed problem- and emotion-focused action as better methods. Even adults endorsed cognitive distraction as the least “effective” strategy; in previous research, children have shown a similarly reduced tendency to endorse or generate emotion-focused strategies (Flavell et al., 2001; Kalish, 1997). It may be that adults and children find it easier to conceptualize “doing” as opposed to “thinking” as a way to regulate emotions, or may have experienced that action-oriented strategies work better. This raises the issue that views on strategy effectiveness may best be understood in the context of an individual’s emotion-regulation success and expertise. Future research should interview children and adults about their personal use of emotion-regulation strategies, as well as including a wider range of emotional contexts. In the present study, adults might have believed that the emotional situations and strategies were irrelevant to adults. Although instructed to answer in a developmentally appropriate way – e.g., telling a friend instead of a mother – some adults may have viewed the strategies as being too “child-like.”

To our knowledge, no studies have examined whether preschool-aged children reason functionally about the links between emotion and emotion-regulation strategies. Our results suggested such links, and were partially consistent with previous findings documenting functional “emotion scripts” in school-aged children (Saarni, 1997). Emotion scripts include implicit and explicit beliefs about expected, appropriate, and effective associations between emotional situations and behavior. As predicted, children appeared to believe that problem-focused repair of the situation was most effective for reducing anger and behavioral distraction was most effective

for sadness and fear. Counter to predictions, cognitive distraction was not considered to be relatively effective for reducing sadness and fear. This may be due to overall reduced preferences for cognitive distraction.

These emotion-specific effects may have emerged because of the belief that a strategy will result in decreased distress or because, as functional emotion theory notes, emotions are inextricably linked to behavioral tendencies, regardless of their regulatory effect. The methodology of the present study (i.e., the rating scale) strengthens the inference that participants viewed a particular strategy as having a regulatory effect (i.e., decreasing negative emotions). Indeed, patterns of individual differences provide a range of indicators that at least some children understood the notion of regulation. For example, some judged that even temporarily increasing an emotion (e.g., venting) could serve to reduce negative emotions. Others showed the inverse by failing to associate ostensibly positive actions with positive feelings (e.g., not judging that they would feel better when playing with a toy). Future research could clarify this issue by eliciting more explicit reasoning from children about what strategies effect changes in emotion and why. In addition, positive emotions should be examined. Children in particular may have experienced that positive emotions at times need to be controlled, such as when they become too excited (Cole et al., 2004; Denham, 1998). Knowledge of functional links among contexts, emotions, and actions may be a target for emotion interventions and a central component of emotional intelligence (Izard, 2002; Saarni, 1997).

Compared to adults, children also indicated that relatively "ineffective" strategies resulted in greater decreases in negative emotions. This might reflect a response bias signaling over-attribution of change among children, or reduced understanding or experiences with emotion regulation. Alternatively, it may be that children genuinely consider a strategy like rumination to be effective because they know that emotions sometimes improve with the passage of time. Future research can tease apart these possibilities by eliciting children's rationales for why strategies are effective (e.g., Saarni, 1997). Another possibility is that adults' views about effective strategies might be more specific or differentiated than those of children. Consistent with this, among the effective strategies, 3-year-olds rated all strategies as resulting in similar emotion change, whereas 4-year-olds and adults rated cognitive distraction as less "effective" than the other strategies. This was one of the few age differences among preschoolers that emerged. One gender difference emerged as well: females viewed emotions as more modifiable by "effective" strategies than did males. Although this gender difference is limited, this finding may reflect greater emotional attunement among females (Nolen-Hoeksema, Larson, & Grayson, 1999; Zahn-Waxler, 1993).

Associations between child understanding and social-emotional adjustment suggest that children's reflections on the effectiveness of distinct emotion-regulation strategies reflect at least some knowledge linked to competencies. When strategies were combined across emotions, children's view that venting would lead to decreased negative emotions was associated with reduced maternal report of social skills. Therefore, a child who fails to recognize that a strategy is relatively immature might show more general difficulties with social-emotional reasoning, skills that are building blocks for social competence. When correlations were conducted separately for each emotion, views on fear in particular were associated with a child's ability to

resist temptations and to marshal the skills necessary to cope with social challenges. Views about strategies to regulate anger, however, were not associated with adjustment in this study. One possibility is that knowledge of anger compared to fear is relatively developed during the preschool years, a period characterized by increased challenges with anger and frustration (Kopp, 1989). Therefore, knowledge of fear might be a more sensitive measure of emotion understanding. A goal for future research is to examine whether improving specific types of emotion knowledge directly reduces risk for adjustment problems (Izard, 2002), and whether knowledge of effective emotion-regulation strategies influences the strategies that children use.

Several limitations to the present study should be noted. After piloting, one vignette per emotion type was chosen in order to keep the puppet show short enough to avoid overtaxing 3-year-olds' attention. Future research should include multiple vignettes spread across multiple testing sessions in order to reduce the chance that children's views about emotion regulation were tied to the specific emotion scenarios portrayed. Another methodological consideration is that children were directly told that emotional vignettes led to the puppet characters feeling very mad, sad, or scared. By doing this, the opportunity for participants to view a situation as being unsuccessful in eliciting an emotion was reduced, but the benefit of this approach was that there was a standard starting point across participants so that views about emotion change could be more clearly evaluated. Future research could assess understanding of both the subjective emotion-induction effects of each vignette and emotion change resulting from strategies.

It is also important to consider how the impact of distinct strategies changes across emotion contexts; for example, in the present study, telling mother while having an argument may be seen as tattling, whereas, in fearful and sad contexts, telling mother may represent support seeking. The opportunities for causal agency also vary across emotional contexts, and will have an impact on whether strategies appear to be effective or ineffective. Careful manipulation and consideration of such contextual and functional characteristics is an important direction for future research. The present study examined only a limited age range, and these views likely change across development (Compas et al., 2001); for example, the impact of cognitive and behavioral strategies, and how these attempts to cope are expressed, likely vary between children who are preschoolers versus those who have experienced the increased social and academic demands of elementary school.

In summary, the present study contributes to a growing body of research on young children's emotion understanding (Bartsch & Wellman, 1995; Denham, 1998; Dunn, 1995; Stansbury & Sigman, 2000) by demonstrating that even very young preschoolers can conceptualize that there are effective ways to regulate emotions. Results also suggest that children have some understanding of functional links between emotions and behavior, and that this may support social-emotional adjustment. Findings provide a fertile basis for future research examining the development of emotion understanding and mechanisms in the development of social-emotional competence.

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Appendix

Mad vignette

Dog and turtle are happy and content, playing with some toys. Each is playing by him/herself but sitting next to the other. They both reach for the same toy.

Dog (looks over at turtle, speaks with emphatic irritation): I need that toy, turtle. (Pulls the toy)

Turtle (angrily protesting): HEY, no-oo! I need that toy!

Dog (very angry, yells): I NEED IT! (To child subject): [Child's name], turtle won't give it to me!

Turtle (also very angry, loud, jumping up): NOOO!! I NEED IT! (They struggle with the toy, then turtle says to child subject in a sullen voice): [Child's name], dog won't give it to me!!!!

Dog and turtle (both very angry, loud, jumping up, approaches as if to hit dog): It's mine!!!!!!

Turtle (to child): I'm telling Mom. MOOOOM!!

Mom (enters, very angry): You two STOP being so MAD! If you do not STOP being MAD, I'm taking all the toys away! (Mom marches off)

Mad strategy choices: 0 = very mad, 1 = a little mad, 2 = just OK, 3 = happy

- | | | | | | |
|---|---|---|---|---|---|
| 1 | Think of how mad (rumination) | 0 | 1 | 2 | 3 |
| | <i>Puppet looks at a picture of a mad face</i> | | | | |
| | Think of something else (cognitive distraction) | 0 | 1 | 2 | 3 |
| | <i>Puppet looks at a picture of attractive objects such as a rainbow, flowers</i> | | | | |
| 2 | Make a mad face (venting) | 0 | 1 | 2 | 3 |
| | <i>Puppet stamps feet and acts out anger</i> | | | | |
| | Do something else (behavioral distraction) | 0 | 1 | 2 | 3 |
| | <i>Puppet plays with a toy</i> | | | | |
| 3 | Tell mom about situation (problem focused, no change) | 0 | 1 | 2 | 3 |
| | <i>Puppet calls for mom</i> | | | | |
| | Stop fighting and share (problem focused, repair) | 0 | 1 | 2 | 3 |
| | <i>Puppet shares toy</i> | | | | |

Sad vignette

Dog and turtle are sitting right next to each other, heads down.

Dog (sniffing, very sad voice): Oh, turtle, our puppy ran away. I am so sad.

Turtle (voice is small and low and sad, head way down): I love our puppy. (Softly crying) Maybe puppy will never come back.

Dog and turtle (more sniffing, crying voice, calling off to the side): Puppy, puppy, please come back! (Sadly, to child): Puppy won't ever come back, [child's name].

Mom (sees children crying): Now, now children. Stop crying. It's time to go outside. You must stop feeling so sad. (Mom exits)

(Dog and turtle still sad and slumping)

Sad strategy choices: 0 = very sad, 1 = a little sad, 2 = just OK, 3 = happy

- | | | | | | |
|---|---|---|---|---|---|
| 1 | Think about the puppy (rumination) | 0 | 1 | 2 | 3 |
| | <i>Puppet looks at a drawing of puppy</i> | | | | |
| | Think of something else (cognitive distraction) | 0 | 1 | 2 | 3 |
| | <i>Puppet looks at a picture of attractive objects such as a rainbow, flowers</i> | | | | |
| 2 | Make a sad face (venting) | 0 | 1 | 2 | 3 |
| | <i>Puppet slumps and acts out sadness</i> | | | | |
| | Do something else (behavioral distraction) | 0 | 1 | 2 | 3 |
| | <i>Puppet plays with a toy</i> | | | | |
| 3 | Tell mom how sad (problem focused, no change) | 0 | 1 | 2 | 3 |
| | <i>Puppet calls for mom</i> | | | | |
| | Try finding puppy (problem focused, change) | 0 | 1 | 2 | 3 |
| | <i>Puppet looks around for puppy</i> | | | | |

Scared vignette

Dog and turtle are sitting right next to each other, watching a TV.

Dog (sounds nervous): Wow, this movie has lots of monsters in it. It is scary!

Turtle (sounds scared, covers eyes): Dog, I don't know if I can watch these scary monsters!

Dog (now also sounding very scared, covers eyes): Oh no! I can't watch! It's too scary.

Dog and turtle: [Child's name], what are we going to do? We feel so scared!

Mom (sees children scared): Now, now children. Stop being so scared. It's time to go bed so you must stop feeling so scared. (Mom exits)

(Dog and turtle sit huddled together shaking, with their eyes covered)

Scared strategy choices: 0 = very scared, 1 = a little scared, 2 = just OK, 3 = happy

- | | | | | | |
|---|---|---|---|---|---|
| 1 | Think of how scared (rumination) | 0 | 1 | 2 | 3 |
| | <i>Puppet looks at a picture of scared face and monsters</i> | | | | |
| | Think of something else (cognitive distraction) | 0 | 1 | 2 | 3 |
| | <i>Puppet looks at a picture of attractive objects such as a rainbow, flowers</i> | | | | |
| 2 | Make a scared face (venting) | 0 | 1 | 2 | 3 |
| | <i>Puppet shivers and huddles, acting out scared face</i> | | | | |
| | Do something else (behavioral distraction) | 0 | 1 | 2 | 3 |
| | <i>Puppet plays with a toy</i> | | | | |
| 3 | Tell mom how scared (problem focused, no change) | 0 | 1 | 2 | 3 |
| | <i>Puppet calls for mom</i> | | | | |
| | Turn off TV (problem focused, change) | 0 | 1 | 2 | 3 |
| | <i>Puppet turns off TV</i> | | | | |