

Children's understanding of anticipatory regret and disappointment

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The anticipation of regret and disappointment plays an important role in decision making by adults. The anticipation of regret may also lead to a desire to avoid feedback about likely outcomes of non-chosen courses of action, while the anticipation of disappointment is associated with avoidance of risk-taking and the deliberate dampening of expectations. The present study used the context of a simple game to examine children's understanding of these anticipatory regret and disappointment emotion-regulation strategies. It was found that even though children 7/8 years of age were able to understand the situational factors that produce disappointment and regret, it was not until 9/10 years of age that children exhibited an understanding of anticipatory regret emotion-regulation strategies, and even at this age children did not exhibit an understanding of the use of dampening of expectations as a strategy for coping with the anticipation of disappointment.

Knowledge of the nature and causes of different emotions is central to our understanding of our own and others' behaviour and motivation. The development of an understanding of emotions has been found, for example, to serve as a powerful tool in children's emotion regulation and management (Denham, 1986; Denham, Zoller, & Couchard, 1994). The anticipation of the kind of emotional response that is likely to occur in different situations also serves as an important guide to behaviour (Mellers, 2000).

Research on children's understanding of the basic emotions of happiness and sadness suggests a well-developed understanding of the nature of these emotions, and of the kinds of situations that produce these emotions, by 5 years of age (Fabes, Eisenberg, Nyman, & Michaelieu, 1991). Children at

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this age also understand the ways in which the anticipation of happiness and sadness can affect behaviour (Denham, 1998; Denham & Couchard, 1990; Strayer, 1986). Comparable knowledge concerning the more complex self-conscious emotions (pride, guilt, shame, embarrassment) does not develop until somewhat later, usually after age 7 (Arsenio & Lover, 1999; Berti, Garattoni, & Venturini, 2000; Harris, Olthof, Terwogt, & Hardman, 1987; Harter & Whitesell, 1989; Nunner-Winkler & Sodian, 1988; Thompson, 1987).

Two emotions that have received relatively little attention in the developmental literature are regret and disappointment. These are both counterfactual-reasoning-based emotions, sharing the characteristic that they depend upon a comparison of a currently experienced situation with some imagined alternative to reality (Amsel & Janit, 1999; Amsel & Smalley, 2000; Mellers, 2000; Ritov, 1996; Roese, 1994; Zeelenberg, 1999a, 1999b; Zeelenberg, van Dijk, Manstead, & van der Pligt, 1998, 2000). Regret, for example, is experienced when we choose a course of action that produces consequences that turn out to be worse than the consequences that we imagine would have occurred if some other course of action had been followed. Disappointment is experienced when the actual outcome in a situation is worse than the outcome we had expected.

The anticipation of regret and disappointment plays an important role in decision making by adults under a broad variety of conditions, helping to explain not only the actual decisions that are made (e.g., Bell, 1983; Hetts, Boninger, Armor, Gleicher, & Nathanson, 2000; Mellers & McGraw, 2001; Miller & Taylor, 1995) but also why we sometimes postpone making any kind of decision at all (Anderson, 2003; Beattie, Baron, Hershey, & Spranca, 1994). Adults also make use of a number of emotion-regulation strategies related to the anticipation of regret and disappointment. The anticipation of regret, for example, may lead to a desire to avoid feedback about likely outcomes of non-chosen courses of action, and if feedback is to be provided, the anticipation of regret leads to the hope that the "alternative outcome" would not have been better than the outcome actually experienced (Amsel, Cottrell, Sullivan, & Bowden, 2005). Similarly, the anticipation of disappointment is associated with avoidance of risk taking and the deliberate dampening of expectations (Zeelenberg et al., 2000), a strategy referred to as "defensive pessimism" (Norem & Smith, 2006).

The ability to accurately anticipate regret and disappointment depends on the development of an understanding of the nature of the situational factors that affect these emotions. Two recent studies of children's understanding of regret (Amsel & Janit, 1999; Guttentag & Ferrell, 2004) have found that, although children as young as 5 years of age are capable of the kind of counterfactual thinking that is required for the experiencing of regret, it is not until approximately 7 years of age that most children spontaneously

apply their counterfactual reasoning skills to their analysis of emotional responses. Guttentag and Ferrell (2004), for example, examined children's understanding of the way in which factors that affect the cognitive mutability of an action (Gleicher et al., 1990; Kahneman & Miller, 1986) will affect the likelihood of experiencing regret. Guttentag and Ferrell (2004) found that 7-year-olds, but not 5-year-olds, understood that regret is more likely to be experienced following a decision to engage in an atypical than a typical action and following a decision framed as a act of commission than as an act of omission.

The findings from the one study in the literature that includes data on children's understanding of disappointment suggests that it is a relatively late developing aspect of children's emotion understanding. Harris et al. (1987) found that it was not until approximately 10 years of age that children were able to generate descriptions of situations that would be expected to produce disappointment. One potential limitation of this study, however, was that the requirement that participants generate scenarios to depict a verbally labelled emotion was a highly demanding test of emotion understanding, and was certainly more demanding than assessing emotion understanding by requiring participants simply to make judgements of the relative emotional responses of characters in stories.

The primary purpose of the present study was to further explore children's understanding of regret and disappointment by focusing on children's understanding of the way in which the anticipation of regret and disappointment may influence behaviour. The issue of the development of the understanding of anticipatory disappointment has not been addressed in any previous research. One study has, however, examined some aspects of children's understanding of anticipatory regret. This study (Amsel, 2003; Bowden & Amsel, 2003) was based upon earlier work by Bar-Hillel and Neter (1996) examining the willingness of adults to exchange a selected lottery ticket. Bar-Hillel and Neter (1996) found that most adults were resistant to changing tickets because they anticipated the regret they would feel if it turned out that they had given up a winning ticket. Bowden and Amsel (2003) presented adults and 11-year-olds with a version of the Bar-Hillel lottery task and found that a majority of participants at each age thought that it was better to stick with one's original choice than to accept an offer to change. However, when participants were asked to justify their decision, significantly more adults than children generated an anticipation-of-regret explanation for their choice.

In the present study, participants ranging from 5 years of age through adulthood played a game in which they were shown three boxes and were told that they would win the contents of the box they selected. Participants were told that one of the boxes contained a big prize, one of the boxes contained a medium-size prize, and one of the boxes contained nothing. The

first stage of the game involved asking participants to select a box that the experimenter would remove, leaving two boxes for participants to choose from for their final selection. Participants then selected one of those final two boxes. In addition to playing the game themselves, participants also watched as a hand puppet played the game with a second set of boxes.

This simple game provided the context for asking participants a series of questions designed to assess their understanding of the emotion-regulation strategies associated with anticipatory regret and anticipatory disappointment. The game situation was also used to create two stories that were used to assess participants' basic understanding of regret and disappointment, thereby permitting an examination of the developmental relationship between the understanding of regret and disappointment on the one hand and the understanding of anticipatory regret and anticipatory disappointment on the other.

Anticipatory disappointment

In order to assess participants' use and understanding of defensive pessimism as an anticipation of disappointment strategy, participants were asked (after the box-selection process was completed) what they expected to see in the box they selected. Dampening of expectations would be reflected in a tendency to expect the selected box to contain nothing rather than containing either of the prizes. Participants also watched as the hand puppet indicated that he was expecting there to be nothing in the box he selected. After hearing this response from the puppet, participants were asked why they thought the puppet might be expecting there to be nothing in his selected box. Any reference to a deliberate strategy of not getting one's hopes up would reflect an understanding of this anticipatory disappointment emotion-regulation strategy.

Anticipatory regret

In the present study, the game was rigged so that all participants, and the puppet, actually won the medium-size prize. After seeing that the medium prize was in the box that they finally selected, participants were asked two questions about the one other box that they could have chosen during the final selection phase of the task. Participants were first asked if they wanted to see what was in the almost-selected box, and then were asked what they hoped to see in the almost-selected box if its contents were shown to them. Anticipation of regret might lead one to not want to see what was in the almost-selected box. Even if one chooses to see the contents of that box, anticipation of regret should lead one to desire to see that the non-selected box contained nothing rather than that the non-selected box contained a prize better than the one actually received.

Participants also watched as the puppet indicated they he would rather not see what was in the other box. Participants were then asked to explain why the puppet might choose to avoid feedback regarding the contents of the non-selected box. The puppet was also asked what he would hope to see in the non-selected box if its contents were shown to him. The puppet responded that he hoped that it contained nothing. Participants were then asked to explain why they thought that the puppet would prefer to see that there was nothing (as opposed the large prize) in the non-selected box.

Regret and disappointment

In addition to tracking developmental change in the understanding of anticipatory regret and disappointment, the present study also examined whether there is a significant developmental lag between (i) the understanding of the situational factors that produce regret and disappointment and (ii) the understanding of anticipatory regret and disappointment. In order to examine this relationship, some participants in the present study made judgements about the relative emotional responses of characters in stories. The characters in each story were playing the same box-selection game described above. In order to assess participants' understanding of the effects of expectations on disappointment, participants were asked to judge which of two characters would feel better about winning a medium-size prize in the box selection game: (i) a character who expected to win a larger prize; or (ii) a character who expected not to win any prize at all. Similarly, in order to assess participants' understanding of regret, the story referred to two characters who won the medium-size prize. One of the characters then learns that the prize in the almost-chosen box was the big prize whereas the other character learns that the almost-chosen box contained no prize at all. Participants were then asked to judge whether one character would feel better than the other about receiving the medium-size prize.

EXPERIMENT 1

The participants in Experiment 1 played the box-selection game and answered a series of questions regarding their own feelings and behaviours. Participants also answered questions regarding the feelings and behaviours of a puppet who played the game in parallel with the participant.

Method

Participants. Nineteen 5/6-year-old children (mean age = 5.9 years), 18 7/8-year-old children (mean age = 7.7 years), 18 9/10-year-old children

(mean age = 10.1 years), and 20 adults were tested in the experiment. The 5/6-year-olds, 7/8-year-olds, and 9/10-year-olds were students at a private parochial school and had parental permission to participate. The adults were undergraduate students who received class credit for their participation.

Materials. The game involved the use of three $7 \times 7 \times 7$ -inch red boxes and three yellow boxes of similar size. The red boxes were used for the participant's game, and the yellow boxes were used for the hand-puppet's game. The prizes that the children thought they could win included a "good prize" (a stuffed animal or a toy race car), a medium prize (a regular #2 pencil), or nothing. The adults thought they could win either \$1.00, 25 cents, or nothing. A strip of paper with faces drawn on it was used to assess participants' feelings about the prize they received. There were five faces: a sad face with a large frown, a sad face with a small frown, a neutral face with a straight mouth, a happy face with a small smile, and a happy face with a large smile. The puppet was a monkey hand puppet who was referred to as "Koko" by the experimenter.

Procedure. Each participant was tested individually. Children were first asked which prize (of the stuffed animal, race car, or pencil) they desired most; this procedure was included in order to make sure the "good prize" was the prize that was most desired by the participant. It was assumed that adult participants desired the \$1.00 prize more than the \$0.25 prize. The three red boxes were then placed on a table in front of the participant. The experimenter explained to participants that there was one of the three prizes in each box and that they would receive the prize located inside the box that they selected. In reality, all three boxes contained a pencil (for the children) or \$0.25 (for the adults).

Participants were then told that the game would be played with only two of the boxes and were asked to select one box to be removed from the game. The experimenter removed the chosen box and placed it on the floor out of sight of the participant. Participants were next told to choose very carefully between the two remaining boxes because they would receive the prize in the box that they now selected. Before participants opened the selected box, they were asked what they expected to see in the box. Participants then opened the box, revealing (in all cases) the medium-size prize. At this point, participants were asked to indicate how they felt about receiving the medium prize by pointing to one of the faces on the 5-point facial expression scale. They were also asked to explain why they felt that way. Participants were then asked whether they would like to see what was in the almost-selected box and, if shown what was in that box, what prize they would like to see in the box they almost chose.

Participants were then introduced to the hand puppet “Koko the monkey”. They were told that Koko was going to play the same game that they had played and that he really wanted to win the big prize. The red boxes were removed and the experimenter placed the three yellow boxes on the table. The experimenter then made Koko choose a box to remove, leaving two boxes for Koko to choose from for his final selection. Koko then chose one of the remaining boxes and the experimenter asked Koko, “What do you expect to see in the box you chose?” Koko “whispered” his reply in the experimenter’s ear and the experimenter then told the participant that, “Koko said he expects that there’s nothing in the box”. Participants were asked to explain why Koko would say that he expected to see nothing in the box that he selected. The box that Koko chose was then opened, revealing that Koko had won the medium-size prize, and participants were asked to indicate how they thought Koko felt about winning the medium-size prize. Participants made their judgements using the 5-point facial-expression scale described above.

The experimenter next asked Koko, “Do you want to know what was in the box you didn’t pick?” and Koko “whispered” his response to the experimenter again. The experimenter told the participant that, “Koko doesn’t want to know” and asked the participant to explain why Koko might not want to see what was in the almost-chosen box. Koko was then asked what he would like to see in the almost-chosen box if its contents were shown to him. The experimenter told the participant, “Koko says he’d want to see that nothing was in the box he didn’t choose” and then asked the participant to explain Koko’s response.

Results

Responses to each question were analysed separately. The coding of responses to the questions proved to be highly reliable. The responses of ten of the participants at each age were coded by a second coder who had been trained in the coding systems by the primary coder. Overall, disagreements occurred in fewer than 2% of the responses that were analysed by the two coders. In all cases of disagreements, the judgement of the primary coder was used in the statistical analyses.

What are you expecting to see in the box you selected? Table 1 presents the percentage of participants at each age who indicated they expected to win the big prize, the medium-size prize, or nothing. Table 1 reveals that whereas a majority of the youngest children indicated that they expected to win the big prize, many of the adults and the 9/10-year-olds expected to win nothing. A chi-square analysis (not including the “don’t know” category) revealed an overall age difference in the pattern of responses, $\chi^2(6) = 17.45$,

TABLE 1
 Percentage of participants at each age (in years) providing each response to the question "What are you expecting to see in the box you selected?"

Response	Age (years)			
	5/6	7/8	9/10	Adult
Nothing	0	6	39	25
Medium-size prize	21	56	28	40
Big prize	68	12	33	25
Don't know	11	0	0	0

$p < .01$. Paired comparisons revealed that the pattern of responses of the 5/6-year-olds differed significantly from that of each of the two older groups and marginally significantly from that of the 7/8-year-olds: for the comparison with the 7/8-year-olds, $\chi^2(2) = 5.33$, $p < .07$; for the comparison with the 9/10-year-olds, $\chi^2(2) = 9.67$, $p < .01$; for the comparison with the adults, $\chi^2(2) = 7.94$, $p < .025$. There was also a significant difference in the response pattern of the 7/8-year-olds in comparison with that of the 9/10-year-olds, $\chi^2(2) = 6.24$, $p < .05$.

How do you feel about receiving the middle-size prize? Responses were analysed by assigning the following scores to each response: Very sad (-2), A little sad (-1), Neutral (0), A little happy (+1), Very happy (+2). The mean rating was above zero at each age: 0.32 for the 5/6-year-olds, 0.50 for the 7/8-year-olds, 0.94 for the 9/10-year-olds, and 0.70 for the adults. The age difference in the rating patterns was not significant.

Why do you feel that way about receiving the medium-size prize? Explanations were classified into four categories: Self-consoling ("At least I got something" or "I could have gotten nothing"), Desire ("Because I wanted the [big prize]" or "Because I really needed the [big prize]"), Self-consoling and desire ("It's better than nothing but I wanted the [big prize]"), and Other (e.g., "Because I guessed right" or "Because this is a fun game"). Table 2 reveals that although participants at all ages were likely to refer to the failure to receive the most desired prize as at least part of their explanation for their feelings, age differences emerged with respect to self-consoling ("At least I got something"). A chi-square analysis of the proportion of participants at each age who generated a self-consoling explanation revealed a significant overall age difference, $\chi^2(3) = 18.26$, $p < .01$. Paired comparisons revealed that the two younger age groups did not differ significantly from each other and the two older age groups did not differ significantly from each other, but a significantly higher percentage of participants in each of the two older age groups made reference to the fact

TABLE 2

Percentage of participants at each age providing each response to the question "Why do you feel that way about receiving the medium-size prize?"

Response	Age (years)			
	5/6	7/8	9/10	Adult
Desires	53	56	39	35
Self-consoling	0	6	22	20
Desire and self-consoling	0	0	11	30
Other	47	39	28	15

that "things could have been worse" than did participants in either of the two younger age groups: for the comparison of the 7/8-year-olds with the 9/10-year-olds, $\chi^2(1) = 4.43$, $p < .05$.

Why would Koko say he expects to see nothing in the box he selected? This question elicited a broad variety of types of responses, particularly by the children. Responses were first classified into one of 3 categories: "Because he doesn't want to get his hopes up", "Other", and "Don't know" (see Table 3). The "other" category included responses such as "Just guessing", "Because he's a monkey/puppet", "Because that's what he thinks", "Because of bad luck", and a number of other responses. The most important of these categories for purposes of the present study is, "Because he doesn't want to get his hopes up". This kind of response reflects an understanding of the role of anticipation of disappointment as a factor influencing expectations. A chi-square analysis revealed that a significantly higher percentage of adults made reference to Koko not wanting to get his hopes up than was the case for any of the groups of children: for the comparison of the adults with the 9/10-year-olds, $\chi^2(1) = 15.64$, $p < .01$.

How does Koko feel about receiving the medium prize? The ratings for Koko's feelings about the medium prize were similar to those of the

TABLE 3

Percentage of participants at each age providing each response to the question "Why would Koko say he expects to see nothing in the box he selected?"

Response	Age (years)			
	5/6	7/8	9/10	Adult
To not get his hopes up	0	0	11	75
Other	63	61	78	25
Don't know	37	39	11	0

self-ratings and, as was the case with the self-ratings, the ratings trended toward more positive ratings with increasing age. The mean ratings (based upon a rating of zero for neutral) were: -0.16 for the 5/6-year-olds, -0.17 for the 7/8-year-olds, 0.33 for the 9/10-year-olds, and 1.2 for the adults. An analysis of variance (ANOVA) revealed a significant age difference in responses, $F(3, 71) = 5.28, p < .01, MSE = 1.31$. Simple effects tests revealed a significant difference between the adults and the 9/10-year-olds, $F(1, 36) = 6.37, p < .02, MSE = 0.88$. No significant differences were found, however, between the three groups of children.

What would you like to see in the non-selected box? Almost all participants indicated that they would like to know what was in the final non-selected box (100% for each of the three groups of children and 90% for the adults). Age differences emerged, however, when participants were asked what they would like to see in the non-selected box. The percentage of participants at each age who responded that they would like to see that the non-selected box contained no prize (as opposed to the non-selected box containing the big prize) was 5% for the 5/6-year-olds, 11% for the 7/8-year-olds, 44% for the 9/10-year-olds, and 70% for the adults. A chi-square analysis revealed an overall age difference in the pattern of responses to this question: $\chi^2(3) = 23.84, p < .01$. Paired comparisons revealed that the two younger age groups did not differ significantly from each other. However, a significantly higher percentage of 9/10-year-olds indicated a preference for seeing nothing in the non-selected box than was the case for the 7/8-year-olds, $\chi^2(1) = 4.98, p < .05$. Although the trend toward a higher percentage of “nothing” responses with increasing age was maintained for the adults, the difference in the percentage of “no prize” responses for the 9/10-year-olds and the adults was not significant, $\chi^2(1) = 2.53, p = .11$.

Why would Koko not want to see what was in the other box? Responses to this question were classified according to whether or not the participant made reference to a desire by Koko to avoid feelings of regret or disappointment. The percentage of participants classified as providing an avoidance of regret or disappointment response was: 0% for the 5/6-year-olds, 33% for the 7/8-year-olds, 91% for the 9/10-year-olds, and 85% for the adults. A chi-square analysis revealed a significant overall age difference in the pattern of responses, $\chi^2(3) = 40.59, p < .01$. Paired comparisons revealed that the two older age groups did not differ significantly from each other, but a higher percentage of adults and 9/10-year-olds than 7/8-year-olds made reference to regret/disappointment avoidance; for the comparison of the 9/10-year-olds with the 7/8-year-olds, $\chi^2(1) = 11.69, p < .01$. The difference between the 7/8-year-olds and the 5/6-year-olds was also significant, $\chi^2(1) = 7.20, p < .01$.

Why would Koko prefer to see no prize in the box he didn't select? Again, responses were classified according to references to a desire to avoid feelings of regret or disappointment. The percentage of participants classified as providing an avoidance of regret or disappointment response was: 0% for the 5/6-year-olds, 17% for the 7/8-year-olds, 83% for the 9/10-year-olds, and 85% for the adults. A chi-square analysis revealed an overall age difference in the pattern of responses, $\chi^2(3) = 43.71$, $p < .01$. Paired comparisons revealed no significant differences between the two younger groups or between the two older groups. However, a higher percentage of participants in each of the two older groups made reference to regret/disappointment avoidance than was the case for participants in either of the two younger groups: for the comparison between the 7/8-year-olds and the 9/10-year-olds, $\chi^2(1) = 16.00$, $p < .01$.

Discussion

Dramatic age differences emerged in patterns of responses to a number of the questions asked in this study. When participants were asked to explain why they felt the way they did about receiving the medium-size prize, virtually none of the children in either of the two younger age groups made reference to the fact that "things could have been worse". In contrast, this kind of self-consoling response was provided by one-third of the 9/10-year-olds and by half of the adults. Similarly, when participants were asked to specify what they hoped to see in the non-selected box, 70% of the adults indicated that they hoped to see that there was no prize in the non-selected box, a response reflective of their anticipation of the regret that would be produced by seeing that the non-selected box contained a prize much better than the one they actually received. A somewhat smaller percentage of 9/10-year-olds gave this response (44%), while almost none of the children in the two younger age groups indicated a preference for seeing no prize in the non-selected box.

The age difference in response patterns was even more dramatic on those questions related to explanations for Koko's responses (responses that were predicated on the anticipation of regret and disappointment and the use of strategies to avoid disappointment and regret). When participants were asked why Koko might expect there to be no prize in the non-selected box, most of the adults made reference to Koko "not wanting to get his hopes up". In contrast, very few children at any age provided this kind of explanation.

In two other cases involving explanations for Koko's responses, the older children (the 9/10-year-olds) responded in a manner similar to that of adults, but in a manner very different from that of the children in the two younger age groups. When participants were asked to explain why Koko would not

want to know what was in the non-selected box, almost all the adults and older children made reference to a desire on Koko's part to avoid disappointment or regret. In contrast, only one-third of the 7/8-year-olds and none of the 5/6-year-olds provided that form of response. Similarly, when participants were asked why Koko would prefer to see no prize in the non-selected box, almost all of the adults and the older children made reference to a desire on Koko's part to avoid disappointment or regret, whereas that explanation was provided by none of the 5/6-year-olds and by only 17% of the 7/8-year-olds.

The interpretation of these findings regarding children's understanding of anticipatory regret and disappointment depends critically upon knowing how well children of different ages understand the situational factors that affect feelings of regret or disappointment. More specifically, it is important to know the extent to which children of different ages understand that someone winning a medium-size prize would be likely to feel worse (experience greater disappointment) if he or she expected to win a bigger prize than if he or she expected to win no prize at all. Similarly, it is important to know the extent to which children of different ages understand that someone winning a medium-size prize would be likely to feel worse (experience greater regret) if he knew that he had almost won a much bigger prize than if he knew that he had almost won no prize at all. Experiment 2 was designed to examine these questions.

EXPERIMENT 2

Participants in Experiment 2 were presented with stories describing the actions and experiences of two children playing the exact game that was used in Experiment 1. In both stories, both characters ended up winning the medium-size prize. In one story (the "disappointment" story), one character expected to win the big prize whereas the other character expected to win no prize. In the other story (the "regret" story), one character learned that the non-selected box contained the big prize whereas the other character learned that the non-selected box contained no prize at all.

Method

Participants. The participants were 15 5/6-year-olds (mean age = 6.1 years), 18 7/8-year-olds (mean age = 7.9 years), 18 9/10-year-olds (mean age = 10.3 years), and 26 adults. Experiment 2 was conducted approximately three months after Experiment 1. For pragmatic reasons, some, but not all, of the participants in Experiment 2 had previously participated in Experiment 1. Specifically, all the 7/8-year-olds and the 9/10-year olds had

previously participated in Experiment 1. The 5/6-year-olds and the adults had not previously participated in Experiment 1.

Materials. Two short stories, each involving two characters playing the same game as the one that was played by participants in Experiment 1, were used in this experiment. In the regret story, both characters received the medium prize. However, one character saw that he would have won the big prize if he had chosen the other box, whereas the other character would have won nothing if he had chosen the other box. In the disappointment story, both characters received the same medium prize, but one character had expected to receive the big prize, whereas the other character had expected to receive nothing.

Procedure. All participants received the regret story before the disappointment story in separate experimental sessions with at least a two-week delay between each session. The 5/6-year-olds and 7/8-year-olds were tested individually. The experimenter read the stories to the 5/6-year-olds and the 7/8-year-olds. The children at these ages were also provided with cartoon-style pictures depicting the events in the story. At the end of each story, the experimenter asked the participants to indicate which character they thought would feel worse about the outcome or whether the two characters would feel the same. Adult and 9/10-year-old participants were tested in group sessions. Participants at these ages were provided a written version of each story and responded in writing to the questions regarding which character would feel worse about winning the medium-size prize or whether the two characters would feel the same. The order in which the options at the end of the story were mentioned was counterbalanced across participants at each age.

Results

Table 4 presents the percentage of participants at each age who made each response for each of the two stories. For the regret story, the “target” character was the character for whom the non-selected box contained the big prize (the character who should feel the greatest regret). For the disappointment story, the “target” character was the character who expected to win the big prize (the character who should feel the greatest disappointment).

Chi-square analyses revealed a significant overall age difference in the pattern of responses for the regret story, $\chi^2(6) = 25.39$, $p < .01$. Paired comparisons revealed no significant differences between the three older age groups, but the pattern of responses of each of these groups differed significantly from that of the 5/6-year-olds: for the comparison of the 5/6-year-olds with the 9/10-year-olds, $\chi^2(2) = 6.44$, $p < .05$. A significant overall

TABLE 4
 Percentage of participants at each age who gave each response for each story in
 Experiment 2

Response	Age (years)			
	5/6	7/8	9/10	Adult
<i>Regret story</i>				
Target character	20	89	61	88
Non-target character	40	11	11	4
Same	40	0	28	8
<i>Disappointment story</i>				
Target character	47	76	92	100
Non-target character	18	6	0	0
Same	35	18	8	0

age difference was also found for responses to the disappointment story, $\chi^2(6) = 18.75$, $p < .01$. Paired comparisons revealed that the pattern of responses of the 5/6-year-olds differed significantly from that of the 9/10 years olds, $\chi^2(2) = 11.14$, $p < .01$, and the adults, $\chi^2(2) = 11.65$, $p < .01$. None of the other comparisons was significant.

Discussion

Age differences were found with respect to children's understanding of both regret and disappointment. Consistent with past research (Amsel & Janit, 1999; Guttentag & Ferrell, 2004) the 5/6-year-olds exhibited little evidence of understanding that the way in which people feel about an outcome can be affected by "what might have been". In addition, fewer than half the 5/6-year-olds judged that someone with high expectations would feel worse than someone with low expectations when the actual outcome proved to be less than optimal. In contrast, most of the 7/8-year-olds understood that high expectations can produce disappointment and that people generally feel worse about an outcome if "what might have been" was better than what actually occurred.

Two design-related limitations of the second experiment must be acknowledged. First, participants at two of the ages had previously participated in Experiment 1. The lengthy time lag between experiments, and the fact that the findings with respect to the understanding of regret directly match those found in previous studies of children's understanding of regret, argues against any significant effect of that prior experience on children's responses to the stories used in Experiment 2. Second, the order of presentation of the stories was consistent across participants, with the regret story presented in all cases prior to the disappointment story, raising the possibility that experience with the regret story might have affected responses to the disappointment story.

GENERAL DISCUSSION

Life is full of experiences in which our choices result in outcomes worse than what would have occurred had a different choice been made. We also have experiences that simply do not live up to our expectations. The present study focused on children's understanding of the emotional consequences of these kinds of experiences. More specifically, the study focused on children's understanding of the consequences for human judgements of the *anticipation* of regret and disappointment.

Consistent with past research, the 5/6-year-olds in the present study exhibited little evidence of the understanding of regret and disappointment (Amsel & Janit, 1999; Guttentag & Ferrell, 2004). The 7/8-year-olds, in contrast, responded in a manner very similar to that of adults on the measures of the understanding of regret and disappointment used in Experiment 2. However, despite their understanding that unmet expectations can produce disappointment and their understanding that "thinking about how things could have been better" can make one feel worse, children at this age provided very little evidence of understanding the way in which the anticipation of regret or disappointment might affect behaviour.

Given that the 7/8-year-olds understood the nature of regret and disappointment, why were their responses so different from those of adults on the measures of the understanding of anticipatory regret and anticipatory disappointment? In one sense, this pattern of results may reflect a measurement sequence; it is simply not possible to understand the consequences of the anticipation of these two emotions before understanding the emotions themselves. Thus, for example, understanding avoidance of feedback as a strategy for coping with the anticipation of regret requires the application, as a tool, of one's more basic understanding of the nature of regret itself.

This description, however, begs the question of the factors responsible for the dramatic age difference in the understanding of anticipatory regret and disappointment found here. One possibility is that, even though children as young as 7 or 8 years of age may understand a great deal about the situational determinants of regret and disappointment, this knowledge may be relatively less accessible for children at that age than is the case for older children and adults. Note that the tasks used in Experiment 2 involved the presentation of scenarios that highlighted the critical situational factors affecting regret and disappointment. Thus, the tasks themselves likely served as strong retrieval cues for the child's knowledge of regret and disappointment and as guides for the child's reasoning about the emotion-influencing features of the situation. In contrast, the measures of the understanding of anticipatory regret and disappointment used in

Experiment 1 provided much less guidance and support for access to the relevant emotion-understanding knowledge

Alternatively, it may be the case that most children at this age have simply not yet acquired knowledge of anticipation of regret and disappointment emotion-regulation strategies, perhaps because they are not yet capable of co-ordinating their knowledge of the situational determinants of regret and disappointment with their reasoning about the consequences of regret and disappointment anticipation.

The 9/10-year-olds in the present study responded in a manner very similar to that of adults on the measures of the understanding of regret and disappointment and also on the measures of the understanding of the emotion regulation strategies associated with the anticipation of regret (avoidance of feedback and hoping that the “alternative not chosen” would be worse than what actually occurred). However, the 9/10-year-olds were much less likely than were the adults to provide an anticipation-of-disappointment explanation (“to avoid getting one’s hopes up”) for why someone would have low expectations regarding an anticipated prize.

It is somewhat puzzling that this one difference was found between the responses of the adults and the 9/10-year-olds, given that no differences were found on the measures of the understanding of anticipatory regret. One possible explanation for this pattern of findings is that it may not be until the teen years that children think about expectations as a feature of cognition that can be brought under voluntary control. Previous research on children’s understanding of the controllability of different mental states (Flavell & Green, 1999) has found large differences between 7-year-olds and adults with respect to the understanding of the controllability of somewhat simpler mental states, such as fearing, thinking, and changing one’s mind. Flavell and Green (1999) also found that even 10-year-olds were not equivalent to adults with respect to their understanding of the degree of controllability of some of the mental states they tested (e.g., thinking, wanting, paying attention). Although Flavell and Green (1999) did not study the understanding of the controllability of expectations, it seems reasonable to hypothesise that young children would consider expectations (like wanting) to be a feature of mind that is beyond voluntary control. Accordingly, the understanding that it is possible to ignore one’s desires in order to deliberately dampen one’s expectations might reflect a fairly sophisticated, and late-developing, aspect of the understanding of mind.

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