

Research Article

Children's Understanding and Experience of Mixed Emotions

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ABSTRACT—*Though some models of emotion contend that happiness and sadness are mutually exclusive in experience, recent findings suggest that adults can feel happy and sad at the same time in emotionally complex situations. Other research has shown that children develop a better conceptual understanding of mixed emotions as they grow older, but no research has examined children's actual experience of mixed emotions. To examine developmental differences in the experience of mixed emotions, we showed children ages 5 to 12 scenes from an animated film that culminated with a father and daughter's bittersweet farewell. In subsequent interviews, older children were more likely than younger children to report experiencing mixed emotions. These results suggest that in addition to having a better conceptual understanding of mixed emotions, older children are more likely than younger children to actually experience mixed emotions in emotionally complex situations.*

Young children think that people can experience only one emotion at a time. As one child interviewed by Harter and Buddin (1987) put it, "You'd have to be two different people to have two feelings at the same time!" (p. 398). As children grow older, however, they come to believe that people can experience mixed emotions (e.g., Arsenio & Lover, 1995; Wintre & Vallance, 1994). Harter and Buddin asked children to describe situations that would make them feel two same-valence emotions (e.g., happy and excited) or two opposite-valence emotions (e.g., happy and sad). Most 6- and 7-year-olds could describe situations that would elicit two same-valence emotions, but only older children managed to come up with situations that would make them feel mixed emotions (i.e., two opposite-valence emotions). In a similar study, Donaldson and Westerman (1986) had children listen to a story about a child who got a new

kitten to replace one that ran away. When most 4- and 5-year-olds were interviewed after the story, they thought that the protagonist would merely feel happy about the new kitten and rejected the notion that the protagonist would feel both happy and sad. Most 7- to 8-year-olds and virtually all 10- to 11-year-olds, however, believed that the story's protagonist would have mixed emotions about getting the new kitten. In sum, children's conceptual understanding of mixed emotions develops with age.

As noted by Harris (1994), however, "Emotion as felt should not be confused with emotion as cognition" (p. 5). Thus, the ability to actually experience mixed emotions may be distinct from the ability to understand mixed emotions. Harter and Buddin (1987), for instance, suggested that children may be able to experience mixed emotions even if they lack a conceptual understanding of mixed emotions. Despite a great deal of research investigating children's conceptual understanding of other people's mixed emotions, no research has examined children's actual experience of emotions in emotionally complex situations. Whitesell and Harter (1989) have found that, when asked to do so, most 9- to 12-year-olds can recall times when they felt both happy and sad. These findings suggest that children can experience mixed emotions, but must be interpreted with caution for two reasons. First, even adults have trouble recalling the emotions they experienced only a few weeks previously (e.g., Christensen, Wood, & Barrett, 2003; Levine, 1997; Thomas & Diener, 1990), so it is quite plausible that the children remembered their emotions inaccurately (Whitesell & Harter, 1989). Second, a prominent model of emotion, Russell's (e.g., Russell & Carroll, 1999) circumplex model, contends that not even adults can feel happy and sad at the same time. According to the circumplex model, at any point in time, an individual's emotional state falls on a single point along the bipolar valence dimension ranging from pleasure to displeasure. From this perspective, people cannot feel happy and sad at the same time any more than they can be in two different places at the same time.

Cacioppo and Berntson's (1994; Cacioppo, Larsen, Smith, & Berntson, 2004) evaluative space model (ESM) recognizes that

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evaluative processes (e.g., approach/avoidance, pleasure/displeasure) tend to be organized in a bipolar fashion in the portions of the nervous system that mature early in development (e.g., subcortical areas). Consider the pain withdrawal reflex, which reflects the operation of the lowest levels of the neuraxis (i.e., the spinal cord; Cacioppo, Gardner, & Berntson, 1999). Painful stimuli lead to contraction of the biceps coupled with relaxation of the triceps, which combine to produce rapid withdrawal of the forearm. Thus, at the level of the reflex, avoidance (i.e., biceps contraction) and approach (i.e., triceps contraction) are mutually exclusive. However, the ESM contends that at higher levels of the neuraxis (e.g., cerebral cortex), which mature relatively late in development (Casey, Galvan, & Hare, 2005), positivity and negativity are separable and partially distinct. Some of these higher areas (e.g., anterior cingulate) appear to be involved in conscious emotional experience (Lane, 2000). Thus, the ESM holds out the possibility that in addition to being able to understand mixed emotions, adults may actually be able to experience such seemingly opposite emotions as happiness and sadness at the same time.

To test this hypothesis, Larsen, McGraw, and Cacioppo (2001) asked people to complete emotion surveys immediately before or after watching the film *Life Is Beautiful* (Benigni, 1997), which describes a father's often comic attempts to keep his son alive and unaware of their plight during their imprisonment in a World War II concentration camp. Before the film, most individuals felt happy or sad, not both. After the film, however, roughly 50% of the participants felt both happy and sad. In two conceptual replications, undergraduates were more likely to feel both happy and sad after moving out of their college dormitories and after their own college graduation ceremony than during typical days on campus. Taken together, these findings are consistent with the ESM's hypothesis that adults can feel happy and sad at the same time.

In sum, whereas prior research has shown that (a) adults can experience mixed emotions (Larsen et al., 2001), (b) 9- to 12-year-olds can recall having experienced mixed emotions (Whitesell & Harter, 1989), and (c) older children have a better conceptual understanding of mixed emotions than younger children do (e.g., Donaldson & Westerman, 1986; Harter & Buddin, 1987), no research has examined whether older children are more likely than younger children to actually experience mixed emotions. To that end, we interviewed children about their emotional reactions immediately after they watched scenes from *The Little Mermaid* (Clements & Musker, 1989), an animated film that culminates in a father and daughter's bittersweet farewell. In addition to asking children about how they felt at the end of the cartoon, we asked them how one of the protagonists felt. This allowed us both to provide a conceptual replication of previous studies that have examined children's understanding of other people's mixed emotions (e.g., Donaldson & Westerman, 1986; Harter & Buddin, 1987) and to examine their actual experience of mixed emotions.

Subjects

The subjects were 105 children from three public schools in Lubbock, Texas. Teachers at these schools distributed information packets including parental-consent and child-assent forms to 647 students. A total of 182 completed forms were returned, yielding a response rate of 28%. The final sample consisted of thirty-four 5- to 6-year olds, thirty-six 8- to 9-year olds, and thirty-five 11- to 12-year olds; comparable numbers of boys and girls were in each age group. Sixty-six of the children (63%) were Caucasian, 23 (22%) were Latino, 13 (13%) were African American, and 3 (3%) were Asian American. Data collected from an additional 9 children were removed because they failed to demonstrate minimal comprehension of the film ($n = 6$), fell outside our age categories ($n = 2$), or refused to complete the interview ($n = 1$). Most subjects reported that they had already seen the stimulus film, *The Little Mermaid*, which is not surprising given its popularity.

Procedure

Each child first watched an edited 8-min clip from *The Little Mermaid*.¹ On the assumption that the film's conclusion was more bittersweet for the father, King Triton, than for his daughter Ariel, we attempted to make Triton the central figure in the clip. During the clip, Triton becomes so angry with Ariel for falling in love with a human that she runs away, but he forgives her in the end. In the final, ostensibly bittersweet scene, Triton allows Ariel to marry the human but must say good-bye to her forever.

After subjects viewed the cartoon, a female graduate student (Y.M.T.) interviewed them about their emotional reactions to it. The interview was adapted from that of Donaldson and Westerman (1986) and began with the open-ended question, "How does the ending of the cartoon make you feel?"² Children who mentioned only one emotion were asked, "Does the ending make you feel anything else?" If, at this point, they had not yet mentioned a positive emotion, they were asked, "Did the ending make you feel happy?" Similarly, if they had not yet mentioned a negative emotion, they were asked, "Did the ending make you feel sad?" Throughout, the interviewer asked the children to explain why they felt the way they did in order to confirm that their emotional reactions were elicited by events from the end of the cartoon.

The interviewer asked several follow-up questions whenever subjects reported opposite-valence emotions. First, the interviewer confirmed that they had experienced mixed emotions by asking, "So the ending of the cartoon makes you feel happy and sad?" (When applicable, the interviewer replaced "happy" and "sad" with the positive and negative emotion words that the child had used.) The interviewer then asked the children if they

¹A digitized copy of the clip can be obtained from the first author.

²We thank Michael Westerman for providing Donaldson and Westerman's (1986) interview materials.

could tell her anything more about what it was like to feel happy and sad and whether they felt "happy and sad at the same time, or first one and then the other."

After being asked about their own emotions, the children were asked comparable questions about Triton's emotions at the end of the cartoon. For instance, they were asked, "How does King Triton feel at the end of the cartoon?" Children who reported (with or without additional probing) that Triton felt mixed emotions were asked follow-up questions comparable to those dealing with the children's own emotions. Finally, the children were asked several questions about what happened during the cartoon (e.g., "Why did King Triton yell at Ariel?"), to ensure that they had paid attention to the cartoon and understood it.

Scoring

Audio recordings of the interviews were transcribed and scored by two judges blind to subjects' age and gender and to the purposes of the study. The judges first read the portions of the interviews dealing with the children's own emotions in order to make three judgments. Specifically, they determined whether the children reported mixed emotions, and, if so, whether they spontaneously reported mixed emotions and whether they reported experiencing simultaneously mixed emotions. To meet criteria for experiencing mixed emotions, children had to (a) report two opposite-valence emotions, (b) list events from the final scene as causes of their emotions, and, (c) when prompted, confirm that they felt both emotions. To meet criteria for spontaneously reporting mixed emotions, children had to report two opposite-valence emotions without having been asked whether they felt happy or sad. To meet criteria for reporting simultaneously mixed emotions, children had to report that they had felt opposite-valence emotions at the same time.

One month later, the judges read the portions of the interviews dealing with the children's perceptions of Triton's emotions and determined whether they thought Triton had experienced mixed emotions, whether they spontaneously reported that he experienced mixed emotions, and whether they thought he experienced mixed emotions simultaneously.

RESULTS

The percentage of children in each age and gender category who reported that Triton experienced mixed emotions, spontaneously reported that he experienced mixed emotions, and reported that he experienced simultaneously mixed emotions is shown in Table 1. To conceptually replicate Donaldson and Westerman's (1986) findings, we submitted the data for each of these three measures of mixed emotions to a hierarchical logistic regression with age and gender included as predictors in the first step and the Age \times Gender interaction included in the second step. Older children were more likely to report that Triton experienced mixed emotions, $b = 0.32$ (odds ratio = 1.38, $p_{\text{rep}} = .97$), to

TABLE 1

Percentage of Children Who Reported That Triton Experienced Mixed Emotions

| Gender category and measure | Age | | | Total |
|--|-----|-----|-------|-------|
| | 5-6 | 8-9 | 11-12 | |
| Girls | | | | |
| Reported mixed emotions | 53 | 72 | 94 | 74 |
| Spontaneously reported mixed emotions | 24 | 39 | 83 | 49 |
| Reported simultaneously mixed emotions | 0 | 33 | 67 | 34 |
| Boys | | | | |
| Reported mixed emotions | 59 | 89 | 82 | 77 |
| Spontaneously reported mixed emotions | 29 | 56 | 71 | 52 |
| Reported simultaneously mixed emotions | 6 | 39 | 59 | 35 |
| Girls and boys combined | | | | |
| Reported mixed emotions | 56 | 81 | 89 | 75 |
| Spontaneously reported mixed emotions | 26 | 47 | 77 | 50 |
| Reported simultaneously mixed emotions | 3 | 36 | 63 | 34 |

Note. Reporting that Triton experienced mixed emotions was a necessary condition for spontaneously reporting that Triton experienced mixed emotions and for reporting that Triton experienced simultaneously mixed emotions, so some subjects are included in more than one percentage.

spontaneously report that he experienced mixed emotions, $b = 0.37$ (odds ratio = 1.45, $p_{\text{rep}} = .997$), and to report that he experienced simultaneously mixed emotions, $b = 0.55$ (odds ratio = 1.55, $p_{\text{rep}} = .999$).³ No other effects were significant. Thus, just as the older children in Donaldson and Westerman's study were more likely to think that a bittersweet story's protagonist experienced mixed emotions, so too were the older children in our study more likely to think that Triton experienced mixed emotions.

We turn now to the children's own emotional reactions. Table 2 presents the percentage of children in each age and gender category who experienced mixed emotions, spontaneously reported mixed emotions, and experienced simultaneously mixed emotions. To examine whether older children were more likely than younger children to actually experience mixed emotions, we submitted the data for each of these three measures of mixed emotions to a hierarchical logistic regression with age and gender included as predictors in the first step and the Age \times Gender interaction included in the second step. These tests revealed linear effects of age on experiencing mixed emotions, $b = 0.36$ (odds ratio = 1.44, $p_{\text{rep}} = .994$), spontaneously reporting mixed emotions, $b = 0.42$ (odds ratio = 1.52, $p_{\text{rep}} = .97$), and experiencing simultaneously mixed emotions, $b = 0.35$ (odds ratio = 1.42, $p_{\text{rep}} = .91$). Thus, the clip elicited more mixed emotions among older children than younger children.

³Odds ratios provide a measure of effect size in logistic regression (Fleiss, 1981). An odds ratio of 1.38, for instance, indicates that the odds that a child reported mixed emotion are 1.38 times greater than those of a child 1 year younger. The p_{rep} statistic represents the probability of replication (Killeen, 2005).

TABLE 2
Percentage of Children Who Experienced Mixed Emotions

| Gender category and measure | Age | | | Total |
|--|-----|-----|-------|-------|
| | 5-6 | 8-9 | 11-12 | |
| Girls | | | | |
| Reported mixed emotions | 0 | 39 | 72 | 38 |
| Spontaneously reported mixed emotions | 0 | 11 | 50 | 21 |
| Reported simultaneously mixed emotions | 0 | 22 | 22 | 15 |
| Boys | | | | |
| Reported mixed emotions | 12 | 61 | 29 | 35 |
| Spontaneously reported mixed emotions | 6 | 17 | 12 | 12 |
| Reported simultaneously mixed emotions | 0 | 6 | 12 | 6 |
| Girls and boys combined | | | | |
| Reported mixed emotions | 6 | 50 | 51 | 36 |
| Spontaneously reported mixed emotions | 3 | 17 | 35 | 16 |
| Reported simultaneously mixed emotions | 0 | 14 | 17 | 10 |

Note. Reporting mixed emotions was a necessary condition for spontaneously reporting mixed emotions and for reporting simultaneously mixed emotions, so some subjects are included in more than one percentage.

Table 2 suggests that there may have been an especially strong linear effect of age among girls, but a curvilinear effect of age among boys. Consistent with this hypothesis were the significant Age \times Gender interactions for experiencing mixed emotions, $b = 0.56$ (odds ratio = 1.75, $p_{\text{rep}} = .95$), and spontaneously reporting mixed emotions, $b = 0.68$ (odds ratio = 1.97, $p_{\text{rep}} = .90$). The Age \times Gender interaction for reporting simultaneously mixed emotions was not significant, $b = -0.13$ ($p = .74$, odds ratio = 0.88, $p_{\text{rep}} = .32$). Follow-up logistic regressions indicated that older girls were more likely than younger girls to report mixed emotions, $b = 0.69$ (odds ratio = 2.00, $p_{\text{rep}} = .99$), and to spontaneously report mixed emotions, $b = 0.74$ (odds ratio = 2.17, $p_{\text{rep}} = .97$), but that older boys were no more likely than younger boys to report mixed emotions, $b = 0.13$ (odds ratio = 1.14, n.s.), or to spontaneously report mixed emotions, $b = 0.10$ (odds ratio = 1.10, n.s.). A logistic regression with a quadratic age term as the predictor, however, revealed that age did have a curvilinear effect on reporting mixed emotions among boys, $b = -1.80$ (odds ratio = 0.17, $p_{\text{rep}} = .96$).⁴ Age did not have a curvilinear effect on spontaneously reporting mixed emotions among boys, $b = -0.73$ (odds ratio = 0.48, n.s.). In sum, age had a linear effect on mixed emotions among girls, but a curvilinear effect for at least one aspect of mixed emotions among boys.

We also investigated the relation between children's experience of emotions and their perceptions of Triton's emotions. Recognizing the protagonist's mixed emotions might be a precondition for experiencing mixed emotions in response to the cartoon (cf. Harter & Buddin, 1987; Wilson & Cantor, 1985).

Consistent with this hypothesis, a McNemar test indicated that children were more likely to report that Triton had experienced mixed emotions (75%) than that they themselves had (36%), $\chi^2(1, N = 105) = 35.56, p_{\text{rep}} > .999$. Similarly, they were more likely to spontaneously report that he, as opposed to they, had experienced mixed emotions (50% vs. 16%), $\chi^2(1, N = 105) = 27.84, p_{\text{rep}} > .999$. Finally, they were more likely to report that he, as opposed to they, had experienced simultaneously mixed emotions (34% vs. 10%), $\chi^2(1, N = 105) = 16.46, p_{\text{rep}} = .997$. Moreover, 36 of the 38 children (95%) who experienced mixed emotions also thought that Triton experienced mixed emotions. In contrast, only 36 of the 79 children (46%) who thought that Triton experienced mixed emotions reported experiencing mixed emotions themselves. These results suggest that in order to experience empathic mixed emotions, children must first recognize the other individual's mixed emotions.

DISCUSSION

Our results replicate those of Donaldson and Westerman (1986), Harter and Buddin (1987), and other researchers (e.g., Wintre & Vallance, 1994) by showing that older children have a better conceptual understanding of mixed emotions than younger children. More important, our results extend these researchers' findings by showing that older children are more likely to actually experience mixed emotions during such emotionally complex situations as a father and daughter's bittersweet farewell. Moreover, our results are consistent with the ESM (Cacioppo & Berntson, 1994) and extend those of Larsen et al. (2001), who demonstrated that adults can experience mixed emotions in emotionally complex situations. They also provide indirect evidence for the ESM's contention that positivity and negativity are more likely to be separable at higher levels of the neuraxis, which mature relatively late in development, than at lower levels (Casey et al., 2005).

Relations Among Understanding, Experiencing, and Reporting Mixed Emotions

Harter and Buddin (1987) called for research on the relation between children's ability to experience mixed emotions and their ability to understand mixed emotions. We found that children were less likely to experience mixed emotions than to think that Triton experienced mixed emotions. Moreover, the vast majority of children who experienced mixed emotions also thought Triton experienced mixed emotions. These findings suggest that the ability to understand mixed emotions precedes the ability to experience mixed emotions. This conclusion must be treated with caution, however, because our subjects were always asked about their own emotions before Triton's emotions. This was necessary because our primary interest was in children's own emotions, but the questions about their own

⁴The quadratic age term was constructed by assigning values of 1, 0, and 1 to kindergartners, third graders, and sixth graders, respectively. This procedure is equivalent to centering and squaring each child's grade level.

emotions may have affected children's inferences about Triton's emotions.

To this point, we have distinguished between children's ability to understand mixed emotions and their ability to experience mixed emotions. A related aspect of children's emotional competence is their ability to report on their emotional experience. Children of the youngest age group we sampled (i.e., 5- and 6-year-olds) can report feeling happy and can report feeling sad (Harris, 2000). This may not imply, however, that they can report feeling mixed emotions of happiness and sadness. Because such young children have trouble understanding mixed emotions, they may have trouble talking about mixed emotions. If so, the 5- and 6-year-olds in our study may have experienced more mixed emotions than they let on. Though this hypothesis has difficulty accounting for the finding that many of our 5- and 6-year-olds managed to report that Triton experienced mixed emotions, future research with nonverbal measures of emotion may shed additional light on the development of children's ability to experience mixed emotions.

Differences Between Boys and Girls

We observed a linear effect of age on the experience of mixed emotions for girls, but a curvilinear effect for boys. Only one investigation of children's understanding of mixed emotions has reported gender effects; Brown and Dunn (1996) found that 6-year-old girls understood mixed emotions better than 6-year-old boys did. One unlikely explanation for our finding is that the 11- and 12-year-old boys lost the ability to experience mixed emotions that they had had earlier in life. A more plausible explanation is that *The Little Mermaid* loses its emotional appeal for boys approaching adolescence. This hypothesis is consistent with the fact that age had a linear effect on boys' perceptions of whether Triton experienced mixed emotions (see Table 1), even though it had a curvilinear effect on their own experience of mixed emotions. Thus, compared with 8- and 9-year-old boys, 11- and 12-year-old boys were more likely to think that Triton experienced mixed emotions, even though they were less likely to experience mixed emotions themselves. These data suggest that the gender effect in our study had more to do with our stimulus (i.e., *The Little Mermaid*) than with substantive differences between boys and girls. In any event, research with gender-neutral stimuli may clarify whether the development of understanding of mixed emotions is comparable in boys and girls.

The Time Course of Mixed Emotions

Both Donaldson and Westerman (1986) and Harter and Buddin (1987) incorporated simultaneous mixed emotions into their developmental sequences. Most of Harter and Buddin's older children, for instance, could readily describe a situation that would make them feel mixed emotions at the same time. Following Donaldson and Westerman, we assessed the time course

of mixed emotions by asking children whether they felt opposite-valence emotions "at the same time, or first one and then the other." Fewer children reported experiencing simultaneously mixed emotions in our study than in previous research, but the linear effect of age on reporting simultaneous mixed emotions was nonetheless statistically significant.

On-line measures of positive and negative affect may provide more valid indices of the time course of children's mixed emotions than the retrospective measures we used. In a relevant study using on-line measures of affect (Larsen, McGraw, Mellers, & Cacioppo, 2004), undergraduates were required to press one button whenever they felt good about how a game of chance was turning out and another button whenever they felt bad. Results indicated that subjects often pressed both buttons at the same time in response to *disappointing wins*, games in which they won \$5 but had had an opportunity to win an even larger amount (e.g., \$12). Subjects felt good because they won, but at the same time felt bad because they could have won even more. More recently, Larsen and McGraw (2006) found that undergraduates often pressed the good and bad buttons simultaneously in response to a bittersweet clip from *Life Is Beautiful*. Future research can further investigate children's simultaneous experience of mixed emotions by having children perform the button-press task as they watch scenes from *The Little Mermaid*.

The Role of Empathy

The disappointing-wins paradigm (Larsen et al., 2004) may also provide an opportunity to examine whether developmental differences in the experience of mixed emotions are mediated by developmental differences in empathy (Wilson & Cantor, 1985). It is possible that the younger children in our study were just as capable of experiencing mixed emotions as the older children were, but failed to experience mixed emotions because they lacked the ability to empathize with the film's protagonists. Harter and Buddin's (1987) study speaks to this hypothesis. Harter and Buddin simply asked children to describe situations that would make them feel mixed emotions. Thus, the children were free to describe situations that did not involve empathizing with other individuals. One child, for instance, described what Larsen et al. (2001) would consider a disappointing win. He remarked, "I was happy I got a bike for Christmas but sad that it was only a 3-speed because I wanted a 10-speed" (p. 389). Just as this child's mixed emotional reaction to a disappointing win had nothing to do with empathy, systematic evidence that disappointing wins elicit more mixed emotions among older children than younger children could not be attributed to age-related differences in empathy.

Beyond Childhood

Our study examined the development of mixed emotions within an important but thin slice of the life span. The developmental trajectory of mixed emotions may extend far beyond childhood

and even adolescence. Indeed, Williams and Aaker (2002) found that older adults were less discomforted by advertisements that elicited mixed emotions than were college-aged adults. Thus, developmental changes in the understanding, experience, and acceptance of emotional contradiction may play out from the beginning of life to the end.

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