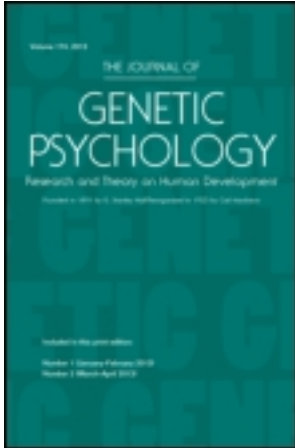


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Publisher: Routledge  
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Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH,  
UK



## The Journal of Genetic Psychology: Research and Theory on Human Development

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/vgnt20>

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Accepted author version posted online: 14 Mar 2013. Published online: 27 Aug 2013.

To cite this article: Ruth T. Zajdel, Jill Myerow Bloom, Gary Fireman & Jeff T. Larsen (2013) Children's Understanding and Experience of Mixed Emotions: The Roles of Age, Gender, and Empathy, The Journal of Genetic Psychology: Research and Theory on Human Development, 174:5, 582-603, DOI: [10.1080/00221325.2012.732125](https://doi.org/10.1080/00221325.2012.732125)

To link to this article: <http://dx.doi.org/10.1080/00221325.2012.732125>

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# Children's Understanding and Experience of Mixed Emotions: The Roles of Age, Gender, and Empathy

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**ABSTRACT.** The present study examined the development of children's ability report understanding and experiencing allocentric mixed emotions, and explored the relation of gender and empathic ability to these skills. Participants (128 elementary school-aged children [63 boys, 65 girls]) were shown a movie clip with bittersweet themes to elicit mixed emotions. Findings from this study are consistent with prior research (Larsen, To, & Fireman, 2007), supporting a developmental progression in children's ability to both understand and report experiencing mixed emotions, with the two as distinct skills and children reporting understanding earlier than experiencing of emotions. Consistent with previous research, girls performed significantly better on the emotion experience task. Finally, results provided evidence that empathy partially mediates the relationship between age and reports of mixed emotion experience, but no evidence that empathy plays a role in mixed emotional understanding.

**Keywords:** emotional development, empathy, mixed emotions

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Emotion understanding and emotion experience are emergent skills that become more complex and organized over the course of development, with marked changes in early and middle childhood, having important implications for social and emotional competence (Saarni, 1999). Particularly, the ability to acknowledge and articulate one's own emotional state, including whether one is experiencing single or multiple emotions, is a primary skill component of developing emotional

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competence. Older children and adolescents participate in increasingly complex social situations, which require them to be aware of and regulate their own emotions, while also being attuned to the emotions of others. Rarely do these situations elicit singular emotions; rather, they often bring out complex, multivalenced, mixed emotions (e.g., a child may feel happy to be invited to birthday party and sad that a friend is not invited, or excited to be going to a forbidden place with friends and scared at the possibility of being caught, or sad following the death of a loved pet and relieved that the pet is no longer suffering). Thus, studying how and when children develop the ability to report experiencing mixed emotions and to recognize them in others makes an important contribution to our knowledge of children's emotional and social development (Arsenio & Kramer, 1992; Brown & Dunn, 1996).

It is important to note that, to date, all of the research on the experience of mixed emotions (e.g., Larsen, McGraw, & Cacioppo, 2001; Larsen, To, & Fireman, 2007), including the present study, has utilized self-report to measure emotional experience. While self-report is a convenient and useful method for measuring emotional experience, it is possible that children can experience mixed emotions with about being able to describe the experience verbally. As such, in the present study we focused on the development of children's ability to verbalize their mixed emotional experience, while acknowledging that the inability to report on or articulate one's emotional experience does not preclude the internal emotional experience.

This ability to recognize and coordinate simultaneous mixed emotions in response to a single event seems to develop in early to middle childhood. Research has shown that while young children tend to deny the existence of opposite valence emotions, older children are able to acknowledge that certain situations can provoke a mixture of positive and negative feelings (Arsenio & Kramer, 1992; Donaldson & Westerman, 1986; Harter & Buddin, 1987; Lagattuta, 2005; Whitesell & Harter, 1989; Wintre, Polivy, & Murray, 1990). However, the pattern and pace of this progression remains unclear. Specifically, little is known about the development of children's abilities to report experiencing mixed emotions and the extent to which this skill is distinct from children's ability to understand mixed emotions. While past studies have demonstrated that adults can experience mixed emotions in response to a variety of stimuli (e.g., Carrera & Oceja, 2007; Ersner-Hershfield, Mikels, Sullivan, & Carstensen, 2008; Hunter, Schellenberg, & Schimmack, 2008; Larsen et al., 2001), only one has demonstrated this same ability in children, and this study used a single evocative movie (Larsen et al., 2007). In the present study we addressed this limitation by exploring the development of the understanding and reported experience of mixed emotions with a dissimilar movie. Furthermore, this study is the first to examine the role of children's empathic ability in relation to the understanding and experience of mixed emotions.

*Development of the Understanding and Experience of Mixed Emotions*

Emotion understanding encompasses a variety of skills, including the ability to accurately use emotional labels, the ability to recognize emotion situations, and the ability to demonstrate knowledge of the causes and consequences of emotions (Denham, 1998). Research suggests that the ability to recognize and coordinate contradictory feelings, such as happiness and sadness or anger and love develops during middle childhood, and that younger children have difficulty comprehending situations in which opposite-valence emotions coexist (Brown & Dunn, 1996; Harter & Buddin, 1987; Whitesell & Harter, 1989). The first studies to explore children's understanding of mixed emotions simply asked children to describe when and how two different emotions could occur at the same time (Harter, 1983; Harter, Miner, & Connell, 1979, as cited in Harter & Buddin, 1987). For example, Harter (1983) asked children to describe a situation that might elicit two positive emotions, two negative emotions, or a mixture of one positive and one negative emotion. She found that while young children (ages 4–5 years) denied that two different types of emotions could co-occur, older children (ages 8–12 years) were able to successfully describe a single situation that might elicit simultaneously felt mixed emotions. Donaldson and Westerman (1986) extended Harter's research by utilizing a story technique in which children were asked to identify a story protagonist's emotions, which could be interpreted as mixed. Consistent with Harter's research, they found that the older children (ages 10–11 years) reported that the story protagonists probably felt a mixture of both positive and negative emotions more often than younger children.

Although developmental differences in children's ability to understand mixed emotions has been replicated several times (e.g., Lagattuta, 2005; Wintre et al., 1990), much less is known about whether there are similar developmental differences in children's ability to verbally express their own experience of mixed emotions. Theorists have long suggested that emotion understanding and emotion experience are separate and distinct domains. Harris (1994), for example, stated that "emotion as felt should not be confused with emotion as cognition" (p. 5). Similarly, Harter and Buddin (1987) suggested that young children who lack the cognitive ability to understand mixed emotions may still have the affective ability to experience them. Few studies, however, have provided empirical evidence to address this contention.

Research with adults has demonstrated support for the ability to report simultaneously experiencing mixed emotions (Larsen & McGraw, 2011; Larsen et al., 2001). For instance, adults have reported mixed emotions in response to evocative movies (e.g., Carrera & Oceja, 2007; Larsen et al., 2001), music (Hunter et al., 2008), and life transitions (e.g., college graduation; Ersner-Hershfield et al., 2008; Larsen et al., 2001). These findings are consistent with the Evaluative Space Model's (ESM) contention that positivity, which encompasses positive evaluative

reactions (e.g., liking) and emotions (e.g., happiness, excitement), and negativity, which encompasses negative evaluative reactions (e.g., disliking) and emotions (e.g., sadness, anger), are separable components of the affect system and can be coactivated in bittersweet situations.

Only one study, to date, has examined whether children can experience mixed emotions. This study used an allocentric (emotions elicited by another person's emotional experience) design, eliciting mixed emotions using a film clip in which characters experienced a mix of positive and negative emotions. Larsen et al. (2007) showed children 5–12 years old a clip that was edited from the Disney movie, *The Little Mermaid*. The edited final scene of the movie, which depicted a bittersweet farewell between a father and his daughter, was believed to elicit a mixture of both positive and negative emotions. After watching the movie clip, all children were asked questions about whether they (a) understood the mixed emotions felt by the protagonist in the movie and (b) experienced the mixed emotions felt by the protagonist in the movie. In addition to replicating evidence for developmental differences in the ability to understand mixed emotions (i.e., Donaldson & Westerman, 1986; Harter & Buddin, 1987; Lagattuta, 2005; Wintre et al., 1990) Larsen et al. examined the development of children's reports of the experience of mixed emotions. They found a developmental progression in the emergence of expressions of mixed emotional experience toward a single event, similar to the emergence of mixed emotional understanding. While it is possible that younger children felt the affective experience of mixed emotions, it was not until middle childhood that the children in this study consistently verbalized experiencing mixed emotions in response to a film character's emotional experience,

Interestingly, however, the development of children's understanding of mixed emotions and the development of their reported experience of mixed emotions did not follow parallel trajectories. Children at all ages were more likely to report that the protagonist in *The Little Mermaid* video experienced mixed emotions than to report that they themselves experienced mixed emotions. Furthermore, almost all of the children who reported experiencing mixed emotions also reported that the protagonist in the movie experienced mixed emotions. In comparison, less than half of the children who thought that the protagonist felt mixed emotions reported experiencing mixed emotions themselves. These findings suggest that the ability to understand mixed emotions emerges prior to the development of the ability to report experiencing mixed emotions. However, it must be noted that the order of questions in this study were not counterbalanced, such that all children were asked about their own emotions before they were asked about the protagonist's emotions. As such, it is possible that the greater number of children demonstrating mixed emotion understanding than mixed emotion experience reflects a priming effect, rather than more developed mixed emotion understanding abilities. It is also possible that participants in this study (Larsen et al., 2007) were capable of experiencing mixed emotions, but the movie stimulus was not powerful enough to

elicit the personal experience of emotions. If this was the case, it would make sense that children would demonstrate understanding the characters emotional experience, but would not experience the emotions themselves.

### *Empathy*

Larsen et al.'s (2007) data seem to suggest that the ability to understand mixed emotions precedes the ability to experience mixed emotions, which raises the possibility that the ability to understand mixed emotions is a prerequisite for the ability to experience mixed emotions. Empathy may mediate the relationship between age and the ability to experience mixed emotions. As Larsen et al. suggested, "[it is possible] that the younger children in our study were just as capable as the older children of experiencing mixed emotions, but failed to experience mixed emotions because they lacked the ability to empathize with the movie's protagonist" (p. 190).

Although there continues to be some disagreement regarding the operational definition of empathy, most definitions refer to the process by which an individual vicariously feels another person's emotional state (Bryant, 1982; Mehrabian & Epstein, 1972; Wied, Goudena, & Matthys, 2005). Goldie (1999) suggested that empathy is the ability to "centrally imagine the other's emotional experiences, or imagine them 'from the inside'" (p. 396). It follows that empathy is needed for the child to experience another's emotions, but not to recognize or understand that another is experiencing an emotional state. Without empathy a child could be able to identify another person's emotional experience, but would not experience those emotions vicariously. Empathy, then, might mediate the relationship between age and the ability to experience mixed emotions, but not the relationship between age and the ability to understand mixed emotions, explaining why experience and understanding do not appear to develop in a parallel fashion and why experience emerges later in development. By incorporating a commonly used self-report empathy measure, we sought to bridge the gap between developmental differences in the abilities to understand and experience mixed emotions.

### *Gender*

Several studies have detected gender differences in children's emotion understanding abilities. Research has shown that, starting as early as preschool, girls outperform boys on emotion understanding tasks (Bosacki & Moore, 2004; Brown & Dunn, 1996; Cutting & Dunn, 1999; Zahn-Waxler, Cummings, & Cooperman, 1984). For example, Bosacki and Moore (2004) asked 3-year-old children to discuss how a puppet would feel after reading a series of vignettes in which protagonists would presumably experience basic emotions, such as happiness and sadness, and complex emotions, such as pride and embarrassment. After controlling for language ability, girls scored significantly higher than boys on the emotion

understanding task. Moreover, gender differences were especially pronounced in response to stories that depicted complex emotions.

It does not appear, however, that girls' emotion understanding always exceeds that of boys. Donaldson and Westerman (1986), for example, found that when boys and girls were presented with stories that had family pets as the target of mixed emotions, their attributions of the protagonist's mixed emotions were not significantly different from one another. Laible and Thompson (1998) found that boys outperformed girls in an emotion understanding task in which they were asked to describe the causes of their peers' naturally occurring emotional displays. Taken together, the findings may indicate that boys' and girls' mixed emotion understanding differs based on the context surrounding the emotion eliciting event.

Little is known about gender differences in children's reports of the experience of mixed emotions. Larsen et al. (2007) did, in fact, detect a gender difference in the reported experience of mixed emotions. Whereas girls steadily progressed in their ability to experience mixed emotions with age, a curvilinear effect emerged for boys such that the oldest boys (ages 11–12 years) were actually less likely to report experiencing mixed emotions than were those in the intermediate age group (ages 8–9 years). Similar to the aforementioned emotion understanding studies, it is possible that this gender difference emerged because all children watched a clip from *The Little Mermaid*. The main theme presented was one of love and romance. Moreover, the bittersweet ending focuses on the relationship between a daughter and her father. Perhaps older boys were less likely to report experiencing mixed emotions because they are socialized to be less interested in love, romance, and relationships between daughters and fathers. To begin to address this potential limitation of Larsen et al.'s study, in the present study we utilized a movie clip that included themes of autonomy and leaving home to achieve a goal; both of which are thought to be socially acceptable for girls and boys in modern Western culture. Additionally, the new movie clip highlighted the relationship between a boy and his father in an effort to make it more engaging for boys than was Larsen et al.'s clip from *The Little Mermaid*. This change was based on findings by Feshbach and Roe (1968) and Bryant (1982), which demonstrated that boys relate more to male characters than they do to female characters.

### *The Present Study*

The present study was designed to examine how children's allocentric mixed emotion understanding and reports of mixed emotion experience abilities develop in relationship to one another and in relation to age, gender, and empathy. Based on past research, it was predicted that older children would be more likely to report that the movie's protagonist experienced mixed emotions than they themselves experienced mixed emotions; and that the ability to understand the protagonist's mixed emotions would develop earlier than the ability to verbalize experiencing mixed emotions in response to the character's emotional experience. In addition,



we predicted that empathic concern would mediate the relationship between age and mixed emotional experience, but would not have an impact on the emergence of mixed emotional understanding. Finally, gender differences in children's mixed emotion understanding and experience were explored. Specifically, we explored whether gender differences in mixed emotion understanding and experience emerged with the new stimulus' theme of autonomy and male target.

## Method

### *Participants*

Participants were 145 children (75 boys, 70 girls) enrolled in a public elementary school in a rural town in upstate New York. Teachers in grades kindergarten through Grade 5 distributed information packets to 628 students, 169 consent forms were signed and returned (27% return rate). From this original sample, 145 children were selected to participate in the present study based on the order in which their consent forms were returned, as well the need to balance age, grade, and gender categories. Of the 145 participating children, one child (<1%) was unable to demonstrate adequate understanding of the movie, seven children (5%) chose not to complete the interview procedure, and nine (6%) children met the exclusion criteria of having either a speech and language impairment or a Learning Disability based on information received from school administrators regarding students' special education status. Thus, the final sample included 128 children (63 boys, 65 girls) with 53 children 5–7 years old (24 boys, 29 girls), 36 children 8–9 years old (22 boys 14 girls), and 39 children 10–12 years old (17 boys, 22 girls). Participants were grouped into these age categories for statistical analysis in order to promote comparison between this study and the Larsen et al. (2007) study, which used the same age groupings. The majority of the sample was Caucasian ( $n = 113$ , 88%). Of the remaining participants, five (4%) were African American, two (2%) were Hispanic, four (3%) were Asian, and four (3%) were of other ethnicities. These proportions are consistent with the population of the entire school (89% Caucasian, 6% African American, 2% Hispanic, 2% Asian, and 1% other ethnicities).

### *Procedure*

Participants met individually with a trained examiner who was blind to the study's hypotheses or with Ruth T. Zajdel (52% of participants), both of whom followed the same written script. No differences emerged based on which experimenter administered the interview. Each child completed a short demographic questionnaire, and then was asked to watch a 10-min movie clip on a laptop computer. The movie clip was edited from the Disney movie *Robots* in which the protagonist, Rodney, is sad to be leaving his parents but happy to be pursuing

his dream of becoming an inventor. A majority of the children ( $n = 96$  [75%]) reported that they had previously seen the movie at least once.

After the movie clip, children were interviewed about how the movie clip made them feel, as well as how they believed the protagonist in the movie felt. Interview questions were adapted from Donaldson and Westerman's (1986) interview procedure and were similar to the interview used in Larsen et al.'s (2007) study. One important addition to Larsen et al. was that the order of the emotion understanding and emotion experience questions were counterbalanced in order to investigate whether children in Larsen et al.'s study were more likely to report that the protagonist experienced mixed emotions than that they themselves experienced mixed emotions only because the questions about the protagonist's emotions came later. After children were shown the movie clip and completed the emotion understanding and experience interviews, children completed a brief empathy questionnaire.

### *Movie Stimulus*

The main storyline of the movie clip involves a young male robot named Rodney who decided to leave his family to travel to the big city. The movie clip emphasized Rodney's close relationship with his father, as well as Rodney's dream of moving to the big city to meet his hero and become a famous inventor. The final scene showed Rodney saying goodbye to his mother and father at the train station. Rodney appeared to be sad that he was leaving his home and his family, but happy and excited about the opportunities that lay ahead.

### *Measures*

*Emotion understanding.* To assess children's understanding of the protagonist's emotion, they were asked, "How did Rodney feel at the end of the cartoon?"

Children who spontaneously reported that Rodney felt positive and negative emotions were then asked why they thought Rodney felt the reported emotions to determine whether children understood the plot of the movie, as well as confirm that their responses were the result of the final scene of the movie clip. Children who reported only one emotion or multiple emotions of the same valence were then prompted by being asked, "Did Rodney feel anything else at the end of the cartoon you just finished watching?" Children who did not respond with an opposite valence emotion after the prompt were asked a second follow-up question. Those who originally reported a positive valence emotion were asked, "Did Rodney feel sad at the end of the cartoon you just finished watching?" Those who originally reported a negative valence emotion were asked, "Did Rodney feel happy at the end of the cartoon you just finished watching?" Whenever children reported that Rodney had experienced an emotion, they were asked to explain why

to ensure that their attribution of Rodney's emotion was explained by events in the movie clip. Finally, all children were asked several general questions about the movie to ensure that they were paying attention and understood the basic plot.

Children's responses were coded categorically based on (a) whether they reported two opposite-valence emotions, such as happy and sad; and (b) whether they reported that Rodney felt mixed emotions spontaneously or only after a prompt from the examiner ("Did Rodney feel happy/sad at the end of the cartoon you just finished watching?"). A research assistant who was trained how to code emotion responses and who was blind to the participants' gender and age scored children's emotion understanding responses. Ruth T. Zajdel also coded 25% ( $n = 32$ ) of children's emotion understanding answers and interrater reliability was assessed and found to be 100% ( $\kappa = 1.00$ ).

*Emotion experience.* To assess emotion experience, children were asked several questions about how they felt at the end of the movie. In keeping with Larsen et al.'s (2007) interview procedure, children were asked, "How did the Rodney cartoon make you feel at the end?" Children who spontaneously reported that they felt a mix of opposite-valence emotions were then asked why they felt the reported emotions. Children who did not report any emotions at all were asked two follow up questions: "Did you feel happy at the end of the cartoon you just finished watching?" and "Did you feel sad at the end of the cartoon you just finished watching?" and then asked to explain why as related to the movie clip in order to provide justification that their emotional experiences were elicited by the stimulus.

Children who reported only one emotion or multiple emotions of the same valence were then prompted by being asked, "Did you feel anything else at the end of the cartoon you just finished watching?" If the child did not respond with an opposite valence emotion after the prompt, he or she was asked a second follow-up question. If the child originally reported a positive valence emotion, he or she was asked, "Did you feel sad at the end of the cartoon you just finished watching?" If the child originally reported a negative valence emotion, he or she was asked, "Did you feel happy at the end of the cartoon you just finished watching?" If the child answered yes to either of the questions, he or she was then asked to explain why.

Children's responses were coded categorically based on (a) whether they reported two opposite-valence emotions, such as happy and sad; and (b) whether they reported feeling mixed emotions spontaneously or only after a prompt from the examiner. As with emotion understanding, interrater reliability was assessed using 25% ( $n = 32$ ) of children's emotional experience answers and was found to be 99% ( $\kappa = .99$ ).

*Revised Index of Empathy for Children and Adolescents.* The Revised Index of Empathy for Children and Adolescents (IECA; Bryant, 1982) is a 22-item questionnaire that includes items that describe situations in which empathic feelings may occur and assesses both cognitive (e.g., “Is it silly for boys to cry when they are happy?” or “Is it hard for you to understand why other people are upset?”) and affective (e.g., “Do you get upset when you see a boy being hurt? or Does seeing a girl crying make you feel like crying also?”) components of empathy. Boys and girls are asked questions about both genders. The measure was adapted from an adult empathy scale originally developed by Mehrabian and Epstein (1972) for use with elementary and high school aged children. Bryant reported internal consistency for the measure using Cronbach’s alpha coefficients of .54 for a sample of first-grade students and .79 for a sample of seventh-grade students. Test–retest reliability across a two-week interval ranged from .74 (for first-grade students) to .86 (for seventh-grade students) and good convergent validity with the adult version of the measure has also been reported (Bryant, 1982).

Consistent with previous studies that have utilized this measure (e.g., del Barrio, Aluja, & Garcia, 2004; Kurtz & Eisenberg, 1983), children were first read two practice items (“Do you like ice cream?” and “Do you like soap in your eyes?”) to ensure that they understood the procedure. The measure yields a total empathy score, with higher scores indicating higher levels of empathy. A reliability coefficient using Cronbach’s alpha was determined to be .56 for the entire population of the present study. Though this coefficient is lower than ideal, it is consistent with findings from Bryant (1982).

## Results

### *Preliminary Analyses*

Given that the movie stimulus used in the present study was edited from a popular children’s movie and a majority of the participants reporting having seen the movie at least once ( $n = 96$  [75%]), preliminary analyses were run to determine whether there were significant differences in the ability to report mixed emotions between children who had seen and children who had not seen the movie *Robots* prior to participating in this study. A series of chi-square analyses revealed no significant relationships between previous viewing of the movie and emotion understanding,  $\chi^2(1, N = 128) = 0.36, p = .551$ , and reported emotion experience,  $\chi^2(1, N = 128) = 0.17, p = .683$ .

### *Descriptive Analyses*

The percentage of children who were unable to demonstrate understanding of the mixed emotions felt by the character in the movie stimulus, who demonstrated understanding of mixed emotions with a prompt, and who demonstrated

**TABLE 1. Percentage of Children Who Reported That Rodney Felt No Mixed Emotions, Felt Mixed Emotions When Prompted, and Felt Mixed Emotions Spontaneously Without a Prompt, by Age Group**

Response to the emotion understanding task	Age group (years)		
	5–7	8–9	10–12
<b>Girls</b>			
Reported no mixed emotions	34	14	5
Reported mixed emotions with prompt	21	14	41
Reported mixed emotions spontaneously	45	72	54
<b>Boys</b>			
Reported no mixed emotions	29	32	18
Reported mixed emotions with prompt	42	27	12
Reported mixed emotions spontaneously	29	41	70
<b>All participants</b>			
Reported no mixed emotions	32	25	10
Reported mixed emotions with prompt	30	22	28
Reported mixed emotions spontaneously	38	53	62

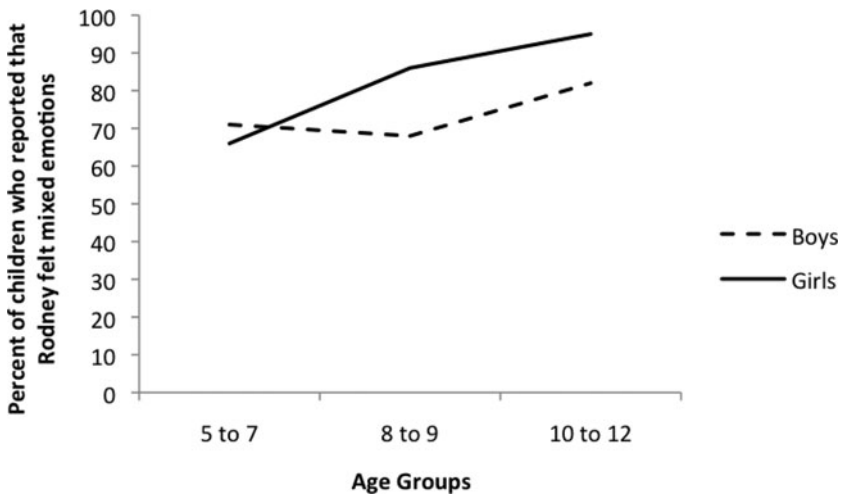
understanding of mixed emotions spontaneously (without a prompt) are shown in Table 1. Visual inspection of the data suggests that a majority of the children in each age category were able to demonstrate understanding of mixed emotions. These data also suggest that as children got older, they were more likely to understand mixed emotions spontaneously and less likely to require a prompt from the examiner.

The percentages of children who failed to report feeling mixed emotions after watching the movie clip, who reported feeling mixed emotions with a prompt, and who reported feeling mixed emotions spontaneously (without a prompt) are shown in Table 2. Visual inspection of the data suggests that a majority of the children in the youngest age category did not report feeling mixed emotions. As children got older, they were more likely to report feeling mixed emotions and less likely to need a prompt from the examiner.

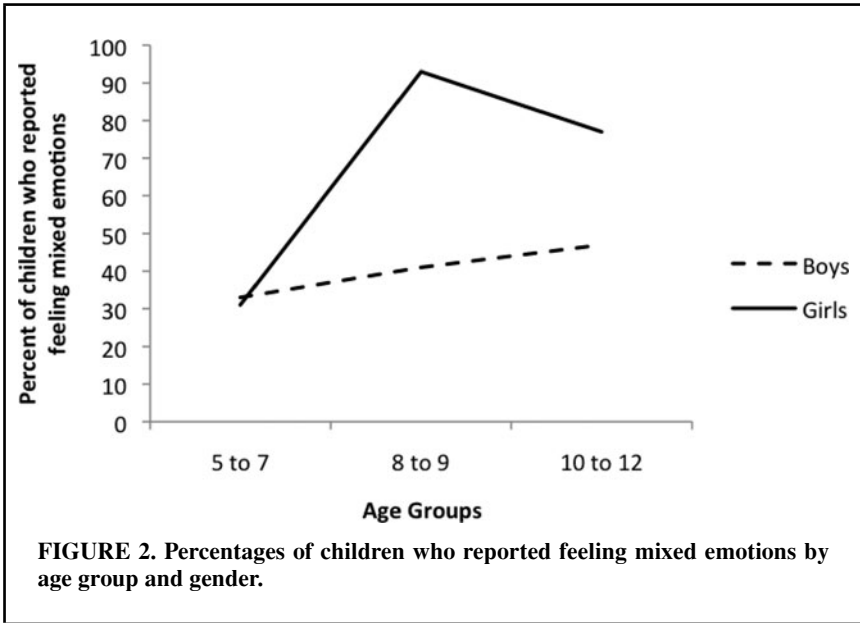
For all analyses, we have collapsed the groups of children who reported mixed emotions with a prompt and those who did so spontaneously into a single group. This is because it does not make logical sense to analyze the percentages of children who reported mixed emotions with a prompt, as only children who did not report mixed emotions spontaneously received the prompt. The percentage of children who demonstrated and justified (with or without a prompt) an understanding of the mixed emotions felt by the character in the movie stimulus are shown in Figure 1.

**TABLE 2. Percentages of Children Who Reported Feeling No Mixed Emotions, Reported Feeling Mixed Emotions When Prompted, and Reported Feeling Mixed Emotions Spontaneously Without a Prompt, by Age Group**

Response to the emotion understanding task	Age group (years)		
	5–7	8–9	10–12
<b>Girls</b>			
Reported no mixed emotions	67	7	24
Reported mixed emotions with prompt	18	64	40
Reported mixed emotion spontaneously	15	29	36
<b>Boys</b>			
Reported no mixed emotions	67	59	53
Reported mixed emotions with prompt	25	27	24
Reported mixed emotions spontaneously	8	14	23
<b>All participants</b>			
Reported no mixed emotions	68	39	36
Reported mixed emotions with prompt	21	42	33
Reported mixed emotions spontaneously	11	19	31



**FIGURE 1. Percentage of children who reported that Rodney felt mixed emotions, by age group and gender.**



The percentages of children who reported and justified (with or without a prompt) feeling mixed emotions after watching the movie clip are shown in Figure 2.

### *Developmental Progression*

To investigate the developmental progression of children's understanding of mixed emotions, age (5–7-year-olds, 8–9-year-olds, and 10–12-year-olds) and gender were simultaneously entered into a logistic regression analysis. Children's age significantly predicted performance on the emotion understanding task ( $\beta = 0.56$ , Wald = 4.39, odds ratio = 1.75,  $p < .05$ ), however, gender did not ( $\beta = 0.50$ , Wald = 1.36, odds ratio = 1.64,  $p > .05$ ). Consistent with prior research (i.e., Donaldson & Westerman, 1986; Larsen et al., 2007), older children were significantly more likely to report that the protagonist experienced mixed emotions than were younger children. Specifically, 68% of children in the youngest age group demonstrated understanding of mixed emotions, 75% of children in the middle age group demonstrated understanding of mixed emotions, and 87% of children in the oldest age group demonstrated understanding of mixed emotions. Follow up analyses using a series of Chi-Square analyses revealed a significant difference between 5–7 years olds and 10–12-year-olds,  $\chi^2(1, N = 92) = 4.58$ ,  $p = .032$ , and no significant differences among the other group comparisons:

5–7-year-olds/8–9-year-olds,  $\chi^2(1, N = 89) = 0.52, p = .47$ ; 8–9-year-olds/10–12-year-olds,  $\chi^2(1, N = 75) = 1.83, p = .18$ . These findings suggest that although children's emotion understanding abilities improve with age, only the changes from the youngest to the oldest age groups reached statistical significance.

To investigate the developmental progression of children's ability to verbalize the experience of mixed emotions, age and gender were entered into a second logistic regression analysis. The results show that children's age ( $\beta = 0.72$ , Wald = 9.87, odds ratio = 2.06,  $p < .01$ ) and gender ( $\beta = 0.90$ , Wald = 5.59, odds ratio = 2.46,  $p < .05$ ) were both significant predictors of children's performance on the emotion experience task. Older children were found to be more likely to report experiencing mixed emotions than were younger children after watching the movie stimulus. Follow up chi-square analyses were run to assess differences in emotion experience among the three age groups. Findings revealed a significant difference between the youngest age group and the middle age group,  $\chi^2(1, N = 89) = 7.34, p < .01$ , and between the youngest age group and the oldest age group,  $\chi^2(1, N = 92) = 9.29, p < .01$ . There was no significant difference found between the middle and oldest age groups,  $\chi^2(1, N = 75) = .072, p = .79$ .

For gender, the results indicate that boys' and girls' abilities to report the experience of mixed emotions developed in a significantly different manner. In light of the significant gender difference follow-up logistic regression analyses were run for the boys' and girls' emotion experience data separately. Age was not a significant predictor of the boys' ability to express feeling mixed emotions at the conclusion of the movie stimulus ( $\beta = 0.29$ , Wald = .80, odds ratio = 2.34,  $p > .05$ ). In comparison, age was found to be a significant predictor for the girls' ability to report the experience of mixed emotions ( $\beta = 1.16$ , Wald = 10.86, odds ratio = 3.18,  $p < .01$ ). Follow-up analyses indicated that 5–7-year-old girls' abilities to verbalize experiencing mixed emotions differed from the abilities of 8–9-year-olds,  $\chi^2(1, N = 43) = 14.44, p < .01$ , and those of the 10–12-year-olds,  $\chi^2(1, N = 51) = 10.7, p < .01$ . However, although there seemed to be some decline from the 8–9-year-old group to the 10–12-year-old group, there was no significant difference in reports of mixed emotions between the two age groups,  $\chi^2(1, N = 36) = 1.50, p = .22$ . These findings suggest that most girls are able to report experiencing mixed emotions by the age of 9 years.

A second set of chi-square analyses was conducted in order to determine which age groups contained gender differences. As illustrated in Figure 2, the results show that there was no gender difference detected among the youngest group of children,  $\chi^2(1, N = 53) = .03, p = .86$ . However, there were significant gender differences detected among the middle group of children,  $\chi^2(1, N = 36) = 9.72, p < .01$ , and the oldest group of children,  $\chi^2(1, N = 39) = 3.80, p < .05$ , with girls reporting the experience of mixed emotions more often than boys in both groups.



### *Understanding Versus Experience*

Larsen et al. (2007) also found that children were more likely to report understanding mixed emotions than experiencing them, suggesting that understanding abilities develop before the ability to report experiencing mixed emotions. A McNemar test for nonparametric paired proportions was used to examine the hypothesis that children in the present study would be more successful with the emotion understanding task than the emotion experience task. The McNemar test indicated that children were more likely to understand mixed emotions (76%) than experience mixed emotions (50%,  $p < .001$ ), which suggests that mixed emotion understanding occurs earlier in development than mixed emotion experience. Results from the present study also found that 53 of the 64 children (83%) who reported experiencing mixed emotions also understood mixed emotions. In comparison, only 44 of the 97 children (45%) who understood mixed emotions also reported experiencing mixed emotions. These findings suggest that most children understood the mixed emotions felt by the protagonist in the movie before they were able to verbalize experiencing those same emotions.

In Larsen et al.'s (2007) study, all children were asked about their own emotions before the emotions of the character in the movie. To address this design limitation, the order of the tasks in the present study was counterbalanced. To determine whether the order in which emotion understanding and emotion experience tasks were presented to children affected their emotion abilities, a series of chi-square analyses was run. There were no significant order effects (both  $ps > .05$ ). Just as children who were asked about their own emotions first were more likely to report that Rodney experienced mixed emotions (76%) than that they themselves experienced mixed emotions (51%), so too were children who were asked about Rodney's emotions first more likely to report that Rodney experienced mixed emotions (77%) than they themselves did (49%). This finding provides further evidence that the ability to understand others' mixed emotions emerges before the ability to experience mixed emotions.

### *Empathy*

For the overall sample, the mean score on the IECA was 13.28 ( $SD = 3.27$ ). An independent samples  $t$ -test was run to assess differential empathic abilities across genders. Results indicated that in the present sample, girls ( $M = 14.22$ ,  $SD = 3.00$ ) demonstrated greater empathic abilities than boys ( $M = 12.12$ ,  $SD = 3.23$ ),  $t(125) = -3.84$ ,  $p < .001$ . A one-way analysis of variance (ANOVA) revealed significant differences in empathic abilities across the three age groups,  $F(2, 125) = 15.03$ ,  $p < .001$ . Bonferroni post hoc tests revealed that 10–12-year-olds scored significantly higher on the empathy measure ( $M = 15.23$ ,  $SD = 2.76$ ) than 5–7-year-olds ( $M = 11.81$ ,  $SD = 2.83$ ,  $p < .001$ ) and 8–9-year-olds

( $M = 13.33$ ,  $SD = 3.21$ ,  $p = .019$ ) The 5–7-year-olds did not differ significantly from the 8–9-year-olds on empathic abilities ( $p = .056$ ).

We conducted a pair of mediation analyses to examine whether empathy mediated the effect of age on children's understanding and experience of mixed emotions. Standard  $p$  values cannot be determined for mediational analyses involving dichotomous variables like ours, so we conducted these analyses using the bootstrapping procedures provided by Preacher and Hayes (2008). The bootstrapping procedure yields a 95% confidence interval; confidence intervals that do not contain zero provide evidence for mediation. The INDIRECT macro indicated that there was a significant effect of age on empathy ( $b = 0.808$ ),  $t = 5.28$ ,  $p < .0001$ , but no effect of empathy on understanding of mixed emotions ( $b = 0.058$ ,  $Z = 0.81$ ,  $p = .42$ , Wald = 0.65). Thus, empathy did not mediate the effect of age on children's understanding of mixed emotions. Empathy did, however, have a significant effect on the experience of mixed emotions ( $b = 0.185$ ,  $Z = 2.69$ ,  $p = .007$ , Wald = 7.22). Moreover, the INDIRECT macro's Sobel test indicated that empathy at least partially mediated the effect of age on experience of mixed emotions ( $b = 0.150$ , 95% CI [0.045, 0.299]) and that the direct, unmediated effect of age on mixed emotions was only marginally significant ( $b = 0.210$ ,  $Z = 1.66$ ,  $p = .10$ , Wald = 2.74). To estimate the magnitude of the mediating effect of empathy on the relationship between age and mixed emotions, we calculated what Preacher and Kelley (2011) termed the *unstandardized indirect effect*. Specifically, we multiplied the regression coefficient for the effect of age on empathy ( $b = 0.808$ ) by that of the effect of empathy on mixed emotions ( $b = 0.185$ ). This yielded a value of 0.150, which indicates that the likelihood of reported mixed emotions is expected to increase by 15.0% per year as a result of the indirect effect of empathy. By way of comparison, the likelihood of reporting mixed emotions is expected to increase by 20.1% as a result of the total effect of age.

## Discussion

Consistent with previous findings (Donaldson & Westerman, 1986; Harter & Buddin, 1987; Lagattuta, 2005; Larsen et al., 2007; Whitesell & Harter, 1989; Wintre et al., 1990; Wintre & Vallance, 1994), the results of the present study demonstrate that mixed emotional understanding and reports of mixed emotional experience emerge with development. The findings presented here demonstrate that children's conceptual understanding of mixed emotions improves with age, though as early as age 5 years, most children have developed the cognitive-emotional abilities needed to reconcile conflicting pieces of emotional information. Similarly, older children were also more likely to report experiencing mixed emotions at the conclusion of the movie stimulus than were younger children. In contrast to the understanding of mixed emotions, however, the majority of 5–7-year-olds failed to report experiencing those same emotions. As such, consistent with Larsen et al.'s findings, the present study revealed that regardless of the

task order, significantly more children were able to demonstrate conceptual understanding of mixed emotions than were able to report experiencing mixed emotions. Moreover, a majority of children who reported experiencing mixed emotions also demonstrated understanding of mixed emotions. In comparison, less than half of children who understood mixed emotions also reported experiencing them. These findings suggest that children's ability to understand mixed emotions is separate and distinct from their ability to report the experience of mixed emotions, which emerges later in development. One explanation of this finding is that the ability to experience allocentric mixed emotions requires cognitive-emotional abilities that develop later in childhood. Another possible explanation is that kids were able to observe others' mixed emotions, but our task was not powerful enough to elicit mixed emotional experience. Using an allocentric design and only a single stimulus may have limited young children's ability to demonstrate mixed emotional experience. Future researchers should examine this question within a broader context.

The ability to verbalize the experience of mixed emotions has been demonstrated in adult populations (e.g., Larsen et al., 2001). However, this study is only the second to demonstrate that children are also capable of reporting feeling simultaneous mixed emotions. The developmental progression in children's abilities to verbalize experiencing mixed emotions provides evidence for the ESM's contention that children's emotional capacities change according to their cognitive-developmental stage. The ESM maintains that coactivation of positivity and negativity is more likely to occur at higher levels of the neuraxis (e.g., frontal cortex), which are more developed in older children (Casey, Galvan, & Hare, 2005).

Interestingly, the present findings are contrary to some earlier predictions about children's emotional development. Specifically, Harter and Buddin (1987) suggested that young children may lack the cognitive ability to understand mixed emotions, but may still have the affective ability to experience them. The authors stated that, "conceptual understanding and experience will not necessarily be synchronous . . . it is plausible that a child may have experienced two emotions simultaneously yet not be able to reconstruct such an occurrence in a cognitively convincing manner" (p. 398). The data from the present study showed the opposite progression with understanding emerging before reports of experience. However, this may be due to the cognitive demands of the present task, which was designed to elicit allocentric rather than egocentric emotions (emotions elicited by personally relevant events). Furthermore, there was a small group of children ( $n = 11$ ), who did report feeling mixed emotions at the conclusion of the movie stimulus, but failed to understand the same emotions in the movie character. Data from this small group of children support Harter and Buddin's contention that in certain instances, children may be able to experience the coactivation of positive and negative evaluative processes without being consciously aware of why they are experiencing mixed emotions, thus being unable to verbalize this experience. This atypical experience of emotion detected by the present study, suggests that these children may lack the cognitive maturity demonstrated by those children who were

able to understand and empathically experience the allocentric mixed emotions depicted in the movie stimulus. Clearly, more research is needed to untangle the developmental relation of mixed emotional understanding and experience through childhood.

Although boys and girls demonstrated a similar developmental progression in their emotion understanding abilities, a clear gender difference associated with their reports of emotion experience emerged. The results showed that gender was a strong and consistent predictor of children's success with the emotion experience task. Follow up analyses revealed that girls tended to report feeling mixed emotions at the conclusion of the movie stimulus significantly more often than did boys. Follow up analyses also revealed that this gender difference was present in the middle and oldest groups of children, but not present in the youngest group of children.

Although these findings are consistent with research that has found girls to be more emotionally mature than boys (Bosacki & Moore, 2004; Brown & Dunn, 1996; Cutting & Dunn, 1999; Zahn-Waxler et al., 1984) as well as research that has found minimal gender differences among young children and the greatest gender differences among older children (LaFrance, Hecht, & Paluck, 2003), this finding was still notable. First, the introduction of a new movie stimulus involving themes of autonomy and leaving home, was presented with the expectation that it would be more engaging to the boys in the present study than the romantic themes presented in the stimulus used in Larsen et al.'s (2007) original study. The themes in the new stimulus are believed to be in line with social expectations in Western culture for boys and girls. Second, the main character of the movie stimulus utilized in the present study was purposefully chosen to be male. Whereas the stimulus utilized in Larsen et al.'s original study emphasized a relationship between a father and a daughter, in the present study we used a movie clip that emphasized the relationship between a father and a son. Despite these changes, gender differences were maintained for the older children. It should be noted that although the stimulus was altered in specific theme and character, the general theme presented continued to emphasize interpersonal relationships between parent and child. Maintaining the relational theme in the stimulus may have perpetuated the male disadvantage that was observed in the Larsen et al. study as the stimulus continued to highlight themes that males are not socialized to connect with or focus on (Fabes et al., 1988). It is possible that the males in this study were equally able to report experiencing mixed emotions as their female counterparts, but failed to do so because they did not identify with the themes presented in the movie clip. Future researchers should attempt to elicit mixed emotions using nonrelational stimulus in order to more accurately understand gender differences in children's mixed emotional experiences.

Another explanation for these gender differences seems to be in part provided by the differential empathy abilities evidenced among boys and girls. Due to the allocentric nature of the emotion tasks presented to children in the present study,

it was predicted that children would need to utilize empathy in order to report the experiencing the mixed emotions felt by the protagonist in the movie stimulus. The results support this connection. Specifically, children's empathy scores were found to significantly predict children's success with the emotion experience task. The relationship between empathy and reported mixed emotion experience was strong and partially mediated the effects of chronological age on children's success with the experience task, suggesting that increases in empathic ability may explain why older children are more able to experience allocentric mixed emotions than younger children.

Consistent with previous studies that have detected gender differences in empathic concern (Roberts & Strayer, 1996; Strayer & Roberts, 1997; Wood et al., 2004), we found that girls scored significantly higher on the empathy measure than did boys. The gender difference detected in children's success with the emotion experience task may be explained by gender differences on the empathy measure. It may be that the boys in the present study were just as capable as the girls in their ability to experience mixed emotions, but failed to do so because they lacked the empathic abilities needed to do so. This possibility is supported by the fact that boys and girls demonstrated no differences in their ability to understand mixed emotions, which is a skill that was found to have no significant relationship with their level of empathy.

The findings presented here must be interpreted with caution due to limitations associated with the measure of empathy that was employed. The IECA is a paper-and-pencil measure of empathy includes self-report items related to children's affective empathy and their attitudes towards others' emotional displays. The measure demonstrated low to moderate internal consistency in the present sample, suggesting that our measurement of the construct of empathy was limited. Future studies should utilize a stronger, more internally consistent measure of children's empathy abilities. The use of self-report as a single measure of children's emotional experience also limits the interpretation of our findings, due to the possibility of reporting bias or young children's inability to accurately report about mental states. Future researchers should attempt to employ multiple methods for assessing children's emotional experience, including functional magnetic resonance imaging and facial coding. However, when facial expression data was collected in a study of children's mixed emotional experiences it was uncodable due to minimal expressivity in children's faces (Fergusson, Bloom, & Fireman, in preparation), limiting this method's ability to enhance our measurement of children's emotions.

Given that a majority of 5–7-year-olds in the present study demonstrated an ability to understand mixed emotions and many of those children also demonstrated an ability to experience mixed emotions, it is important that future research utilize a broader age range of children. Using an allocentric design allowed for the examination of the relation between reported mixed emotional experience and understanding and empathy. However, future researchers should also examine

children's egocentric emotions. Focusing on children's egocentric emotions will allow us to better comprehend the developmental progression of children's abilities to understand and report experiencing mixed emotions without having to reconcile the confounding nature of more sophisticated cognitive skills needed for the understanding and experience of allocentric emotions, such as empathy. Research examining children's egocentric emotions will also help to clarify gender differences in children's ability to experience mixed emotions. The results of the present study show that girls were more likely to report experiencing mixed emotions than were boys, but that this disparity appears to be explained by the gender difference associated with empathy scores. Research utilizing egocentric tasks, by definition, will not require children to use empathic concern to be successful.

### AUTHOR NOTES

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*Original manuscript received May 2, 2012*

*Final version accepted September 13, 2012*