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## Children's understanding of nonverbal expressions of pride

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### ABSTRACT

To chart the developmental path of children's attribution of pride to others, we presented children (4 years 0 month to 11 years 11 months of age,  $N = 108$ ) with video clips of head-and-face, body posture, and multi-cue (both head-and-face and body posture simultaneously) expressions that adults consider to convey pride. Across age groups, 4- and 5-year-olds did not attribute pride to any expression presented, 6- and 7-year-olds attributed pride only to the multi-cue expression, and 8- to 11-year-olds attributed pride to both the head-and-face and multi-cue expressions. Children of all ages viewed the postural expression as anger rather than pride. Developmentally, pride is first attributed only when several cues are present and only later when a single cue (head-and-face) is present.

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### Introduction

Theorists have suggested that the expression of pride serves an important function in social interactions, allowing individuals to display social dominance, elicit attention from others for their achievements, and establish social hierarchies (Darwin, 1872/1965; Williams & DeSteno, 2008, 2009). Interpreting others' expressions of pride has been suggested to be essential for social functioning, and although children have been shown to display pride expressions beginning at around 2 years of age (Jennings, 2004; Stipek, 1995), little research has examined the development of children's interpretations of pride or whether children attribute pride to expressions in the same manner as adults do.

Prior research using static photographs found that adults attributed pride only to a combined head, facial, and postural expression (Tracy & Robins, 2004). Children (4- to 7-year-olds) matched the label *pride* to this expression as well (Tracy, Robins, & Lagattuta, 2005). However, this study did not examine children's spontaneous attributions of emotion; rather, children matched a given label (*pride*) to one of

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three presented photographs (depicting pride, happiness, or surprise) and only the pride expression contained postural components. Children's attribution of pride to the expression was low (mean = 59%, where random responding would be 33%), and even this low percentage may have been inflated by the uneven presentation of postural expressions across photographs (Tracy et al., 2005) and by the forced-choice method used (Russell, 1993). This prior research leaves open the question of how children spontaneously interpret expressions of pride (i.e., without labels provided), information necessary to determine how children's daily interpretations of complex social interactions and expressions develop and when these interpretations come to resemble those of adults.

It is possible that children's attribution of pride to a display will be greater when more information is provided. For example, the static photographs commonly used omit information contained in the dynamic expressions children see in daily interactions. And indeed, adults are more likely to attribute the expected emotion to a dynamic display than to a static one (Ambadar, Schooler, & Cohn, 2005; Bould, Morris, & Wink, 2008; Wehrle, Kaiser, Schmidt, & Scherer, 2000). In addition, adults attribute pride to a dynamic head and facial expression alone even when postural information is not included (Nelson & Russell, 2011b); perhaps with the presentation of dynamic stimuli, children will also find a head and facial expression to be sufficient for attribution of pride.

To chart the developmental course of children's attributions of pride based on nonverbal cues, we presented 4- to 11-year-olds with expressive components previously associated with pride. We asked a professional female actor to create a dynamic pride expression in which facial and postural cues were presented simultaneously in an intense but realistic display. She also created displays of happiness, fear, surprise, disgust, and embarrassment, all of which included head, facial, and postural cues (for details, see Nelson & Russell, in preparation, 2011a). For each emotion, we created 5-s video clips for three conditions: Head-and-Face-only, Body Posture-only, and Multi-cue (both head-and-face and body posture). In a within-participant design, we showed children all six emotions in each of the three conditions for a total of 18 trials.

## Method

### *Participants*

Participants were 108 children, with 36 children in each of three age groups: 4- and 5-year-olds ( $M = 55$  months,  $SD = 4.5$ ), 6- and 7-year-olds ( $M = 80$  months,  $SD = 10.0$ ), and 8- to 11-year-olds ( $M = 117$  months,  $SD = 14.8$ ). Each age group included an equal number of males and females. All children were fluent in English and tested at child care centers in the greater Boston area or at the Boston Museum of Science.

### *Materials*

The video clips were of an approximate standard length (5 s) and featured a professional female actor who had more than 10 years of acting experience in theater and film. Although no sound was presented, the actor said the same neutral sentence in each of the video clips ("I felt this feeling before; it was just a few days ago").

The cues to pride that the actor performed were modeled after previously suggested information concerning the expression of pride (Darwin, 1872/1965) and expressions used in previous research (Tracy & Robins, 2004, 2008). In addition, the actor relied on her expertise and experience in acting to ensure that the entire expression was realistic.

### *Head-and-Face-only video clip*

This expression included a slightly tilted head and a small smile, as described in previous research (Nelson & Russell, 2011b; Tracy & Robins, 2004). Only the actor's head and neck were visible, and the actor moved from a neutral expression to an emotional expression while speaking (no sound was presented).

### *Body Posture-only video clip*

This expression included the actor's head and body, but her face was obscured with a Gaussian blur throughout the clip. The actor was standing and moved from a neutral posture to an expanded emotional posture (which she maintained throughout the expression). Two postures have been associated with pride in previous research, arms akimbo and arms raised over the head (Tracy & Robins, 2004, 2008), and the actress displayed both of these postures, first placing her arms akimbo and then raising her arms over her head.

### *Multi-cue video clip*

The actor simultaneously displayed the head and facial expression (moving from a neutral face to an emotional face) and body posture (moving from a standing neutral posture to an expanded emotional posture). The cues used in the Multi-cue clip were identical to those used in the other clips.

### *Manipulation check*

In prior research (Nelson & Russell, 2011b), the facial expression presented was coded using the Facial Action Coding System (Ekman & Friesen, 1978) to ensure that the expression included the suggested facial components, and the postural expression was verified using the Pride Nonverbal Coding Scheme (Tracy & Robins, 2008) to ensure that the postural expressions included the suggested head, arm, and body components used in prior studies.

### *Procedure*

#### *Priming*

Children first underwent a priming procedure to make the needed emotion terms as accessible as possible. The experimenter initiated a conversation with the children about feelings, asking questions such as: "Happiness is a feeling; have you ever felt happy?" The labels targeted in the priming session were those that were to be presented in the study (*pride, happiness, fear, surprise, disgust, and embarrassment*), and all children who participated in the study heard each target emotion label twice before participating.

#### *Introductory video clips*

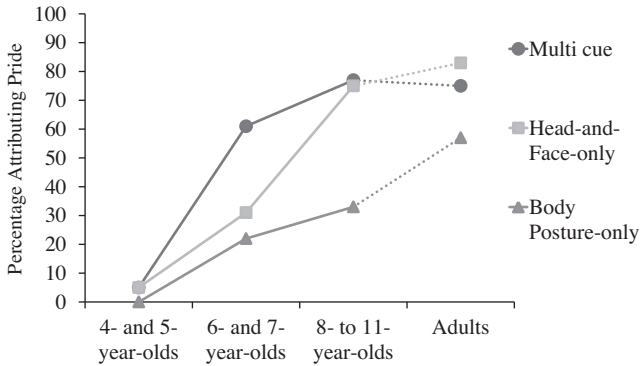
Children in the two youngest age groups (4- and 5-year-olds and 6- and 7-year-olds) were first shown three introductory video clips of the actor performing normal daily activities in her house but displaying no emotion. Children were asked to label an easily recognizable household object held by the actor in the video clip (book, apple, or hat) to ensure that they were able to produce labels in reference to the video clips when prompted. All children in these age groups correctly labeled the objects presented.

#### *Target trials*

The video clips were presented as three separate blocks of trials (Head-and-Face-only, Body Posture-only, and Multi-cue), and all six emotions were presented within each block.<sup>1</sup> The emotions within each block of video clips were ordered using a Latin square design. Head-and-Face-only and Body Posture-only were presented first, in counterbalanced order; the Multi-cue block was always presented last.

Children were introduced to each block of trials by the experimenter, who gave a general verbal description of the block: "Molly is going to show us how she feels. But in these videos, we will see her face [body or face and body]. So, we can watch her face [body or face and body] to see how she feels." The video clip was then played, and the actor displayed an emotional expression. Children were asked to answer the question "How did she feel?" and were free to give any emotion label they chose.

<sup>1</sup> Findings concerning children's labeling of the nontarget emotions in the study (happiness, fear, surprise, disgust, and embarrassment) are available from the authors on request.



**Fig. 1.** Percentage of children attributing pride to pride clips. Children's performance is compared to adult's performance in prior research (Nelson & Russell, 2011a).

We chose this free-labeling format over a forced-choice format to examine participants' spontaneous rather than forced interpretations of cues.

### Scoring

Children used a variety of labels to describe the emotions shown (e.g., *joyful*, *frustrated*, *afraid*, *grossed out*). Three independent judges, blind to the stimulus condition, sorted the labels into one of eight categories: happiness, sadness, anger, fear, surprise, disgust, embarrassment, and pride. Labels placed in the same category by two of the three judges were scored as correct for that category. Labels for which judges could not come to an agreement were categorized as "other." For the category of pride, two labels were scored as correct: *proud* and *confident*. All other labels used were categorized into one of the other categories listed.

## Results and discussion

### Effect of cue type

A one-way repeated-measures analysis of variance (ANOVA) examining children's labeling of the pride clips showed that, as expected, children's likelihood of attributing pride to the clips increased with age,  $F(2, 105) = 9.28$ ,  $p < .001$ , partial  $\eta^2 = .38$ . Least significant difference (LSD) post hoc tests indicated that 8- to 11-year-olds<sup>2</sup> were most likely to attribute pride to the clips presented (percentage attributing pride = 62%), followed by 6- and 7-year-olds (40%) and 4- and 5-year-olds (4%) (all  $ps < .001$ ). Children's performance also varied with the cue presented,  $F(2, 210) = 2.42$ ,  $p < .001$ , partial  $\eta^2 = .22$ . Children attributed pride to the Multi-cue clip (48%) significantly more often than the Head-and-Face-only (37%) and Body Posture-only (18%) expressions (all  $ps < .004$ ). These results indicate that, overall, children were more likely to attribute pride to an expression with combined facial and postural cues than to a single cue.

Of particular interest to this study, the effect of cue was qualified by a Cue  $\times$  Age interaction,  $F(4, 210) = 8.33$ ,  $p < .001$ , partial  $\eta^2 = .14$  (Fig. 1). The 4- and 5-year-olds were unlikely to attribute pride to any of the cues (range of percentages attributing pride: 0–5%); this was likely due to a floor effect, suggesting that preschool-aged children do not spontaneously attribute pride to any expression presented. LSD post hoc tests indicated that the 6- and 7-year-olds were more likely to attribute pride

<sup>2</sup> A repeated-measures ANOVA showed no effect of age on the performance of 8- to 11-year-olds,  $F(3, 32) = 2.33$ ,  $p = .09$ , so these children were grouped together as a single age group.

**Table 1**

Percentage of labels from each category given for each cue type for pride.

Label used	Head-and-Face-only	Body Posture-only	Multi-cue	Mean
Pride	<b>47</b>	27	<b>52</b>	42
Happiness	<b>47</b>	9	38	31
Anger	1	<b>52</b>	4	19
Surprise	3	2	1	2
Other	2	10	5	6
Total	100	100	100	

Note:  $N = 108$ . Maximum = 100. The modal response for each cue is given in bold.

to the Multi-cue clip than to either the Head-and-Face-only or Body Posture-only clips (all  $ps < .001$ ), a pattern that replicates prior findings with children presented with static photographs (Tracy et al., 2005). In addition, 6- and 7-year-olds were as likely to attribute pride to the Head-and-Face-only expression as they were to the Body Posture-only expression, suggesting that these cues conveyed pride equally well to children of this age, although not as well as a combined facial and postural expression. However, the 8- to 11-year-olds showed an adult-like pattern; they were as likely to attribute pride to the Head-and-Face-only expression as they were to the Multi-cue expression. The 8- to 11-year-olds were less likely than adults to attribute pride to the Body Posture-only expression; their performance was similar to that of the 6- and 7-year-olds, suggesting that 8- to 11-year-olds showed a greater increase in attributing pride to the Head-and-Face-only expression than to the Body Posture-only expression. Overall, 8- to 11-year-olds showed a response pattern similar to that found in prior research with adults; adults were equally likely to attribute pride to the Head-and-Face-only and Multi-cue expressions and less likely to attribute pride to the Body Posture-only expression (Nelson & Russell, 2011b).

#### Terms used to label pride components

Across the three pride clips, 58% of children's responses were other than *pride* (Table 1). For the Multi-cue clip, children's modal response was *pride* (52%), followed by *happiness* (38%). However, for the Head-and-Face-only expression, children's responses were equally divided between *happiness* (47%) and *pride* (47%). Finally, as has been found with adults (Nelson & Russell, 2011b), children's modal response for the Body Posture-only expression was *anger* (52%). These results suggest that, like adults, children interpret the Head-and-Face-only and Multi-cue expressions as expressing positive emotions (either pride or happiness), but the Body Posture-only expression is interpreted as displaying anger. The emotion of pride is often considered to be positive in valence, but these results indicate that it is the facial component of this expression that prompts children to interpret the display as positive; when the facial expression is absent, they are more likely to interpret the display as negative.

#### Conclusion

These results provide the first evidence of the development shift in children's attributions of pride to expression components. Preschool-aged children do not spontaneously attribute pride to expressions but rather attribute happiness to the Head-and-Face-only and Multi-cue expressions. However, 6- and 7-year-olds attribute pride to an expression that contains both facial and postural cues but do not attribute pride to these cues individually. Finally, children 8 years of age and older, like adults, attribute pride to the face alone and do not find an additional benefit when presented with an expression that contains facial and postural cues to pride. Children's understanding of pride expressions appears to develop beyond elementary school, however, given that 8- to 11-year-olds' attributions of pride to the Body Posture-only clip had yet to reach adult-like levels.

That preschoolers did not attribute pride to the expressions presented is a finding in contrast to existing research using static photographs in which preschoolers matched a pride expression with a label (*proud*) given by the experimenter (Tracy et al., 2005). Two possibilities arise that could explain

this difference. One possibility is that preschoolers are less likely to attribute the expected emotion to a facial and postural expression that is dynamic than to one that is static. However, previous research has shown that preschoolers' labeling of emotions is unaffected by whether the stimuli are static or dynamic (Nelson & Russell, 2011c), making this suggestion unlikely. A second explanation is that preschoolers' apparent ability to recognize pride in prior research was due to the forced-choice method used. Preschoolers may have attributed pride to the expression only because the word was provided by the experimenter; the results of this study show that their spontaneous interpretations of the expression follow a different pattern. It is possible that prior findings reflect preschoolers' likelihood of matching the label *pride* to an expression, whereas the results of this study reflect preschoolers' spontaneous interpretations of an expression, as would happen in everyday life.

Although 8- to 11-year-olds showed adult-like response patterns for the Head-and-Face-only and Multi-cue clips, their attributions of pride to the Body Posture-only clip were lower than those of adults in prior research (Nelson & Russell, 2011b). This suggests that children first reach adult-like proficiency in attributing pride to expressions containing a facial expression (Head-and-Face-only and Multi-cue), and understanding of postural expressions continues to develop after 11 years of age.

Children interpreted the postural components associated with pride as conveying negative emotion (anger) when presented alone, but when presented with a facial expression (i.e., the Multi-cue clip) they interpreted the overall expression as positive (pride or happiness). These results suggest that it is the facial component of the pride expression that conveys positive emotion, supporting prior research with adults (Nelson & Russell, 2011b). Adults have been shown to view pride expressions as displaying both "pride" and "determination" (historically considered a negative emotion [Schlosberg, 1954]) (Harmon-Jones, Schmeichel, Mennitt, & Harmon-Jones, 2011) and interpret the postural component of pride as highly dominant (Snyder, App, & McIntosh, 2011). It is possible that children in this study interpreted the postural display as "dominant" or "determined" and, therefore, attributed a negative aggressive emotion to the display: anger.

This research raises broader questions concerning children's everyday social interactions in which pride is expressed. It is possible that preschool-aged children are entirely unable to spontaneously attribute pride to others, but an equally likely possibility is that another stimulus would prove to be a better cue for these children (e.g., stories about events that evoke pride or other facial expressions). Children have been shown to attribute emotions in an adult-like manner to stories at younger ages than they do to facial expressions (Balconi & Carrera, 2007; Reichenbach & Masters, 1983; Widen & Russell, 2010), and prior research has shown this to be the case for pride as well (Nelson, Hudspeth, & Russell, 2011). It is possible that preschoolers first understand pride in terms of events and only later match these events to expressions. In addition, children's increased likelihood of attributing pride to the components presented in this study may simply be due to cognitive maturation but may also be related to their increased experiences with school-aged peers seeking to establish social hierarchies, resulting in an increased sensitivity to pride expressions. The recognition of pride has been suggested to be essential for successfully navigating complex social interactions, and this research illustrates the complex and multifaceted developmental processes that occur as children come to view these expressions in the same way as adults do.

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