Developmental Trends in Children’s Use of Emotion Terms
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Abstract
Children (N = 64; 2 and 3 years of age) labeled another child’s emotion, based on either a prototypical facial expression or on a story about prototypical emotional events for 5 emotions (happiness, sadness, anger, fear, and disgust). Proportion correct was low and improved only gradually with age. Children shown the faces produced more correct labels than did those told the stories. Initially, children used (and overgeneralized) two emotion labels (happy and sad) and only gradually added others (anger, fear, and disgust, in that order).

Introduction
Told that Judd is receiving presents at his birthday party, most adults would guess that Judd is happy. Shown Judd smiling, most adults would, again, guess that Judd is happy. But which of these two cues – a story about the emotion’s antecedents and consequences or a picture of its facial expression – is the better cue? Which cue is better for preschool children? An answer to this question can help chart the development of children’s emotion categories underlying their use of emotion terms.

One possibility is that to a preschooler facial expression is a primary source of information about the emotions of others (Izard, 1994; Denham, 1998; Magai & McFadden, 1995). If so, young children might do better (make fewer errors) with facial expressions than with other cues to emotion. Another possibility is that causal antecedents and consequences are a primary source of information in that children understand emotion in a stimulus-response framework (Bullock & Russell, 1986; Harris, 1983). If so, young children might do better with stories that tell of the event that leads to the emotion. The cue that works best for younger children is likely to be the origin of children’s understanding of emotion. In this study, we asked children, aged 2 or 3 years, what emotion Judd is feeling, given one of two cues: either a prototypical facial expression of the emotion or a story specifying a prototypical causal antecedent events to
the emotion and its consequences. We examined five emotions (happiness, fear, anger, disgust, sadness).

Method

Participants
Participants were 64 children (32 girls and 32 boys) enrolled in daycares and preschools in or near Vancouver, British Columbia. All children were proficient in English. There were 16 children (8 girls and 8 boys) in each of four age groups: young 2s (24 to 29 months), older 2s (30 to 35 months), young 3s (36 to 41 months), and older 3s (42 to 47 months).

Materials

Photographs of Facial Expressions. A set of 5 black and white 5 x 7” photographs of a 12-year-old boy posing of prototypical facial expressions of emotion (happiness, fear, anger, disgust, sadness) were used (Widen & Russell, 2001). The facial expressions had been prepared to meet Ekman and Friesen’s (1978) criteria for particular discrete emotions.

Stories of Emotional Events. Five stories describing stereotypical emotion-eliciting events and responses were created (Table 1) based on prior work in our lab in which children generated causes and consequences of specific emotions. The children were shown a drawing depicting a setting of each story (e.g., a bedroom) while the story was being read.

Procedure

Each child participated in the two parts of the procedure in a single session. Each child’s emotion concepts were first primed. The child was then randomly assigned to either the face or story condition. The child was asked to label either five facial expressions or five stories of emotional events.

Priming. The experimenter first spent time playing with a child until the child seemed comfortable with the experimenter. In order to prime the child’s emotion concepts, the experimenter began a conversation about whether the child and his or her parents had ever felt the five target emotions (happy, sad, mad, scared, disgusted). The experimenter asked, for example, “Does Y ever feel happy?” “Do you sometimes feel
Every effort was made throughout the experiment to use a neutral tone of voice when presenting the emotion words.

**Faces.** The experimenter introduced the faces by saying, “I brought some pictures of Judd a boy named Judd. Would you like to look at them with me? Okay, here is a picture of Judd [showing the neutral expression]. Do you know what Judd is going to do? He is going to show us how he feels sometimes.” The experimenter then showed the child the five facial expressions, one at a time in a random order. For the first face, the experimenter said, “One day, Judd felt like this [pointing to the face].” For the other faces, the experimenter said, “One week later, Judd felt like this [pointing to the picture].” After each picture, the experimenter asked, “How do you think Judd feels in this picture?”

**Stories.** The experimenter introduced the stories (Table 1) by saying, “I’m going to tell you some stories about things that happened to a boy named Judd. After each one, you get to tell me how you think Judd feels. How does that sound? Remember: listen carefully, because you have to tell me how Judd feels.” The experimenter then presented the stories, one at a time in a random order. The first story began, “Once upon a time,” and the other stories began, “One week later…” After each story, the experimenter asked, “How do you think Judd feels?”

**Scoring**

The child participants were allowed to use any label they chose. The scoring key used in this study was drawn from Widen and Russell (2001) who describe the development of a scoring key based on ratings of two judges blind to the source of the labels. Responses to the faces and stories that were scored as correct for happiness were happy, excited, going to play; for fear, scared; for disgust, disgusted, yucky, gross; for anger, angry, mad, cross, frustrated, grumpy; and for sad, sad. Responses varied from what was just listed in syntax or by being embedded in a phrase (e.g., very scared, totally grossed out). These were all the labels children used that came close to specifying the specific emotion.
Table 1
The Five Emotion Stories

<table>
<thead>
<tr>
<th>Emotion</th>
<th>Story</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happiness</td>
<td>It was Judd’s birthday. All his friends came to his birthday party, and they all ate birthday cake. Judd got lots and lots of presents.</td>
</tr>
<tr>
<td>Fear</td>
<td>Judd was in bed. He was all alone and it was very dark. Judd heard something moving in the closet, and he wanted to hide under the bed. Then he heard the closet door open, and Judd wanted to run away.</td>
</tr>
<tr>
<td>Anger</td>
<td>Judd was at daycare. He spent a long time building a block tower. So long that it was very tall. But then a boy came and touched his beautiful tower. Judd said, “Be careful!” But the boy knocked it down anyway. Judd wanted to yell at that boy and hit him.</td>
</tr>
<tr>
<td>Disgust</td>
<td>Judd found an apple. It looked big and juicy. Judd took a big bite. Then he saw a worm inside of the apple. He spit it out and threw the apple on the ground. He did not want to touch it.</td>
</tr>
<tr>
<td>Sadness</td>
<td>Judd went to feed his pet gold fish. But it was not swimming. It was not even in the fish tank. Judd’s fish had died. He really missed his fish.</td>
</tr>
</tbody>
</table>

Results

Proportion Correct

In a repeated measures ANOVA (alpha = .05), sex (2 levels), age (young 2s, older 2s, young 3s, older 3s), and mode of presentation (story, face) were between-subjects factors; emotion (happiness, fear, anger, disgust, sadness) was the within-subject factor. The dependent measure was whether the response was correct or not, scored 1 or 0, respectively.

Age. There was a significant main effect for age, $F(3, 48) = 17.37, p < .001$, which showed the typical improvement in performance with age (Figure 1). The improvement in performance with age replicated in both modes of presentation.
Mode. The main effect for mode was significant, $F(1, 48) = 5.73, p = .02$, showing that facial expressions were better than stories as cues to emotion. This advantage replicated for each of the three eldest age groups (Figure 1).

Emotion. There was a main effect for emotion, $F(4, 192) = 26.01, p < .001$. The proportion correct for happiness (.63) and sadness (.52) did not differ significantly, and were each significantly higher ($p < .02$) than the proportion correct for each of the other emotions. The proportion correct for anger (.38) was significantly higher ($p < .03$) than the proportion correct for fear (.25) and disgust (.09). The proportion correct for fear was significantly higher ($p = .01$) than proportion correct for disgust.

Figure 1. When we investigated the proportion of correct responses, our results were replicated the results of similar studies: Performance was poor, and proportion of correct responses increased gradually with age. The advantage of the story mode was evident by 2.5 years, and persisted for the three eldest age groups.

The mode-of presentation x emotion interaction was also significant, $F(4, 192) = 3.27, p = .01$ (Figure 2). The superiority of the facial mode replicated in happiness (except for young 2s), fear, anger, sadness, and although LSD comparisons indicated that differences between modes were significant for anger and sadness ($p < .001$). For anger, the difference between modes was significant for the two eldest groups; for sad this difference was significant for the older 2s and the older 3s. There was no effect of mode on disgust (for which performance was lowest overall) and a hint of a reversal (non-significant) for happiness for young twos.

Analysis of Errors

In this analysis, we investigated how frequently children in each age group used an emotion label incorrectly in each mode of presentation. According to Bullock and Russell (1986), children initially have fewer but broader emotional categories than do
adults. On this account, around their 2nd birthday, children have only two categories: feeling good and feeling bad. With experience, these two emotion categories are gradually differentiate until they form adults’ categories. If so, children should use happy and sad in inappropriate contexts; that is, these terms will be overgeneralized. With increasing age, the frequency of overgeneralization should decease as other emotion categories/labels are adopted.

In the story mode (Figure 3), the young 2s used only happy and sad when they incorrectly labeled a story. The older 2s also used happy and sad almost exclusively, but angry was also used occasionally. Thus, for 2-year-olds in the story mode, the emotion domain

Figure 2. The Face Superiority Effect occurred for happiness (except for young 2s), fear, anger, and sadness, but not for disgust.
is initially divided into two categories (happiness and sadness), with anger beginning to emerge. The younger and older 3s used \textit{angry} and \textit{sad} (but not \textit{happy}) when they incorrectly labeled a story, suggesting that, by their third birthday, children are clearer on realm of pleasant feelings and that they have refined their realm of unpleasant feelings two categories: anger and sadness.

\textbf{Discussion}

The results of this study are based on children’s responses to only one set of facial expressions and one set of stories, and thus clearly require replication with other stimuli. But the results are intriguing nonetheless, and have some interesting implications regarding the emotion categories that underlie emotion terms and how they change between children’s second and fourth birthday.
With the exception of the youngest children, our preschoolers made more errors in labeling stories than faces. This result is similar to the results of other studies of children’s knowledge of emotion (e.g., Izard, 1971; Harrigan, 1984; Wiggers & van Lieshout, 1985; Markham & Adams, 1992). Also as in previous research, the children here performed poorly, and improved only gradually with age. Thus, when one focuses only on children’s correct responses to emotional facial expressions or stories, it seems that their knowledge of emotion is limited. Indeed, the young 2s’ proportion of correct responses never exceeded .25 (even for the happy story). And even older 3s’ performance remained low for the fear and disgust stories and faces.

However, when the focus is changed to the types of errors that children make, their interpretation of emotion looks more systematic. Young 2s use mainly happy and sad (with a few tokens of angry as well). The results with stories show that they also overgeneralize happy and sad. The results with faces show that they do not use happy for any negative facial expression, and overgeneralization for faces is thus limited to sad.

At 2 ½ years, the initial negative category is differentiating into sad and angry. Fear is also starting to appear, but is not overgeneralized.

Three-year-olds continue these trends. Categories of happiness, sadness, and anger continue to be used correctly and to be overgeneralized. Fear and especially disgust begin to be used but are rarely overgeneralized. This result suggests that when children are unsure of the correct label, they do not randomly produce an emotion term. Instead, they use a label from their earlier-emerging, broader emotion categories (happiness, sadness, anger). This results also suggests that later-emerging emotion categories might be narrow and tightly constrained so that they are unlikely to be applied even to prototypical (to adults) faces and stories for such emotions.

Interestingly, the most frequent errors differed between modes, with sad (26) and happy (11) being the most frequently incorrectly used labels in the story mode, and angry (10) and sad (7) in the face mode. This finding suggests that children are interpret stories and faces differently, even when the examples for each are prototypical and clear.
References


