



Emotion comprehension between 3 and 11 years: Developmental periods and hierarchical organization

Francisco Pons , Paul L Harris & Marc de Rosnay

To cite this article: Francisco Pons , Paul L Harris & Marc de Rosnay (2004) Emotion comprehension between 3 and 11 years: Developmental periods and hierarchical organization, European Journal of Developmental Psychology, 1:2, 127-152, DOI: [10.1080/17405620344000022](https://doi.org/10.1080/17405620344000022)

To link to this article: <https://doi.org/10.1080/17405620344000022>



Published online: 17 Feb 2007.



Submit your article to this journal [↗](#)



Article views: 2472



View related articles [↗](#)



Citing articles: 206 View citing articles [↗](#)

Emotion comprehension between 3 and 11 years: Developmental periods and hierarchical organization

Francisco Pons and Paul L. Harris
Harvard University, Cambridge, MA, USA

Marc de Rosnay
University of Oxford, UK

In the last 20 years, it has been established that children's understanding of emotion changes with age. A review of the extensive literature reveals at least nine distinct components of emotion understanding that have been studied (from the simple attribution of emotions on the basis of facial cues to the emotions involved in moral judgments). Despite this large corpus of findings, there has been little research in which children's understanding of all these various components has been simultaneously assessed. The goal of the current research was to examine the development of these nine components and their interrelationship. For this purpose, 100 children of 3, 5, 7, 9 and 11 years were tested on all nine components. The results show that: (1) children display a clear improvement with age on each component; (2) three developmental phases may be identified, each characterized by the emergence of three of the nine components; (3) correlational relations exist among components within a given phase; and (4) hierarchical relations exist among components from successive phases. The results are discussed in terms of their theoretical and practical implications.

Over the last two decades several cognitive-developmental laboratories have demonstrated important changes in children's understanding of emotion between the ages of 18 months and 12 years. These changes include children's developing understanding of the nature of emotions, their causes and the possibility of control (for recent reviews see Harris, 2000; Manstead, 1994; Pons, Harris & de Rosnay, 2000; Saarni, Mumme & Campos, 1998). By bringing together a substantial body of research employing a wide range

Correspondence should be addressed to Paul L. Harris, Harvard University, 503A Larsen Hall, Appian Way, Cambridge, MA, 02138, USA. Email: paul_harris@harvard.edu

This study was supported in part by a grant from the Swiss National Science Foundation (No. 8210-056618). We would like also to thank all the pupils and school staffs who participated in the study.

of methods and samples, at least nine different components of the children's emotion understanding may be identified. They can be briefly summarized as follows.

Component I (Recognition). By approximately 3–4 years of age, children start to be able to recognize and name emotions on the basis of expressive cues. For example, most children of this age can recognize and name facial expressions of the basic emotions (happiness, sadness, fear, and anger) when presented as pictures (Bullock & Russell, 1985; Cutting & Dunn, 1999; Denham, 1986; Dunn, Brown, & Beardsall, 1991; Hughes & Dunn, 1998; Rothenberg, 1970).

Component II (External cause). By approximately 3–4 years, children begin to understand how external causes affect the emotions of other children. For example, they can anticipate the sadness another feels at the loss of a favourite toy or the happiness another experiences when receiving a gift (Barden, Zelco, Duncan, & Masters, 1980; Cutting & Dunn, 1999; Denham, 1986; Borke, 1971; Fabes, Eisenberg, Nyman, & Michaelieu, 1991; Harris, Olthof, Meerum Terwogt, & Hardman, 1987; Hughes & Dunn, 1998).

Component III (Desire). By approximately 3–5 years children begin to appreciate that people's emotional reactions depend on their desires. They can therefore understand that two people may feel a different emotion about the same situation because they have different desires (Harris, Johnson, Hutton, Andrews, & Cooke, 1989; Yuill, 1984).

Component IV (Belief). Between 4 and 6 years, children start to understand that a person's beliefs, whether false or true, will determine his or her emotional reaction to a situation (Bradmetz & Schneider, 1999; Fonagy, Redfern, & Charman, 1997; Hadwin & Perner, 1991; Harris et al., 1989).

Component V (Reminder). Between 3 and 6 years: Children start to understand the relation between memory and emotion. For example, they increasingly understand that the intensity of an emotion decreases with time and that some elements of a present situation can serve as reminders that reactivate past emotions (Harris, 1983; Harris, Guz, Lipian, & Man-Shu, 1985; Lagattuta & Wellman, 2001; Lagattuta, Wellman, & Flavell, 1997; Taylor & Harris, 1983).

Component VI (Regulation). Children invoke different strategies for emotional control as they get older. Children aged 6–7 years refer mostly to behavioural strategies, whereas older children aged 8 years and older start to

acknowledge that psychological strategies (denial, distraction, etc.) can be more effective (Altshuler & Ruble, 1989; Band & Weisz, 1988; Harris, 1989; Harris & Lipian, 1989; Harris, Olthof, & Meerum Terwogt, 1981; Meerum Terwogt & Stegge, 1995).

Component VII (Hiding). Potentially, there can be a discrepancy between the outward expression of emotion and the actual, felt emotion. Between approximately 4 and 6 years, children begin to understand this possible discrepancy (Gardner, Harris, Ohmoto, & Hamazaki, 1988; Gross & Harris, 1988; Harris, Donnelly, Guz, & Pitt-Watson, 1986; Jones, Abbey, & Cumberland, 1998; Joshi & MacLean, 1994; Saarni, 1979).

Component VIII (Mixed). From approximately 8 years, children start to understand that a person may have multiple or even contradictory (ambivalent) emotional responses to a given situation (Arsenio & Lover, 1999; Brown & Dunn, 1996; Donaldson & Westerman, 1986; Fischer, Shaver, & Carnochan, 1990; Harris, 1983; Harris, Olthof, & Meerum Terwogt, 1981; Harter & Buddin, 1987; Hughes & Dunn, 1998; Kestenbaum & Gelman, 1995; Meerum Terwogt, Koops, Oosterhoff, & Olthof, 1986; Peng, Johnson, Pollock, Glasspool, & Harris, 1992; Steele, Steele, Fonagy, Croft, & Holder, 1999).

Component IX (Morality). From approximately 8 years, children begin to understand that negative feelings ensue from a morally reprehensible action (e.g., lying, stealing, concealing a misdemeanour) and that positive feelings ensue from a morally praiseworthy action (e.g., making a sacrifice, resisting a temptation, confessing a misdemeanour) (Harter & Whitesell, 1989; Harter, Wright, & Bresnick, 1987; Nunner-Winkler & Sodian, 1988; Lake, Lane, Harris, 1995).

The research reviewed above represents a considerable corpus, but the developmental relationships among these various components of emotion understanding have rarely been examined. Most investigators have tested either younger (2 to 6 years) or older (7 to 12 years) children and they have assessed children's understanding of only one or two components. Current psychometric instruments are also restricted. For example, in the Kusché Affective Interview (Revised), children are asked to supply personal examples of 10 different emotions and to cite the information used for the recognition of five emotions in themselves and other people (Cook, Greenberg, & Kusché, 1994). In the Rothenberg Test of Social Sensitivity, children are asked to recognize others' emotions (happiness, anger, sadness, and anxiety) by listening to tape-recorded scenarios of characters interacting in conjunction with photos depicting the appropriate emotions of the characters (Rothenberg, 1970). In the test

procedures developed by Denham (1986), children are asked to identify the facial expressions associated with particular emotions and to identify emotions that are both typical and atypical for familiar situations. Thus, no study has presented children with all nine components in order to assess their relative difficulty and their organization with respect to one another. Our first goal, therefore, was to examine, using a single methodology, the development of these nine components of emotion understanding. More precisely, we were interested to know if distinct developmental periods could be identified for children's emotion understanding. Is it the case, for example, that the mastery of certain components is characteristic of a given developmental period? The second goal was to examine relationships across all nine components of emotion understanding and to ask if there is a hierarchical organization among them. More specifically, is mastery of certain components a prerequisite for the mastery of other components?

In order to compare children's performance across all nine components, it was important to use a single, consistent methodology. In particular, it was important to ask children to make an equivalent type of response for each component, wherever possible. To this end, for any given component, children were presented with a brief vignette and asked to identify the particular emotion(s) that the protagonist would feel by choosing from four alternatives depicting different facial expressions. In order to be able to test children from a wide age range, these four alternatives were selected from four basic emotions ("happy", "sad", "scared," and "angry") and a neutral alternative ("just alright"). Thus, more complex emotions (e.g., "ashamed" and "embarrassed") that might be difficult for younger children to recognize, and indeed difficult to depict, were not included as alternatives.

In order to assess children's understanding of all nine components in a single session, it was also necessary to keep the testing of any particular component as brief as possible. In general, therefore, children were presented with one vignette for each component. The choice of an appropriate vignette was guided by the relatively extensive literature reviewed above. Insofar as children's ability to: (1) differentiate among facial expressions; and (2) appreciate the relationship between a particular situation and a given emotional expression was critical for their accurate performance across components, children's performance on these two components (i.e., Component I: Recognition and Component II: External cause) was tested more extensively. Thus, their recognition of the five different facial expressions was tested for Component I and their ability to select the facial emotion provoked by five different external causes was tested for Component II.

METHOD

Participants

A total of 100 children was tested. They were divided into five different age groups of 20 children each: 3 years ($M = 3$ years and 0 month, $SD = 3.1$ months); 5 years ($M = 4$ years and 11 months, $SD = 1.0$ month); 7 years ($M = 7$ years and 2 months, $SD = 1.9$ months); 9 years ($M = 9$ years and 1 month, $SD = 2.6$ months); and 11 years ($M = 11$ years and 0 month, $SD = 2.8$ months). In each age group, there were 10 girls and 10 boys. All were normal children with no known learning or language problems. None of the children had repeated school years and all had English as their first language. Family background ranged from lower to middle class. All the children were tested at local playgroups, preschools and schools in the city of Oxford, United Kingdom.

Materials and procedure

Testing was done on an individual basis. A set of materials designed to assess all nine components of emotion understanding was developed. It consisted of a picture book in which children were shown simple cartoon scenarios and read the story accompanying each cartoon scenario. The nine components were presented in a fixed order that corresponded loosely to the presumed order of difficulty. This fixed order was selected in order to reduce the likelihood that younger children would be confused or discouraged early in the assessment procedure. The fixed order also served to maintain children's interest because it permitted certain components to be linked together in a narrative format (see the vignettes for Components IV, V and VI below). In a further effort to maintain children's interest, they were asked during the presentation of some items to lift a flap that revealed a hidden object or creature. To answer any given item, children had to point to one of four emotions represented as cartoon facial expressions (occasional exceptions to this pattern are noted under the description of each component). Figures 1, 2 and 3 illustrate items for the Recognition, Belief and Mixed components respectively. Administration lasted for approximately 15 minutes. A detailed description of the item(s) for each component is given below.

The test materials consisted of an A4 picture book with a simple cartoon scenario in the upper section (in a frame of 16 cm \times 11 cm) of each page. Beneath each scenario, were four emotional outcomes, typically represented as facial expressions (in four different frames of 7.5 cm \times 5.5 cm). The general procedure (with the exception of Component I, see below) was divided into two steps:

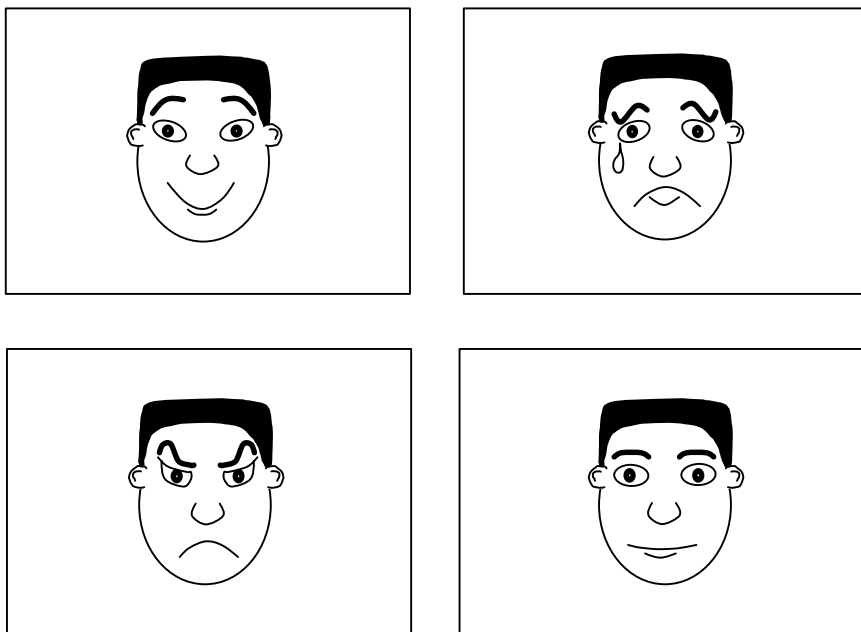


Figure 1. Example of emotional outcomes (Component I: Recognition).

- 1 While showing a given cartoon scenario, the experimenter read the accompanying story about the depicted character(s). The face(s) of the characters in the cartoon were left blank. The situations were described in an emotionally neutral fashion with a deliberate attempt to remove verbal and non-verbal emotional cues.
- 2 After hearing the story, the child was asked to make an emotion attribution to the main character by pointing to the most appropriate of the four possible emotional outcomes (depicted below the scenario). Children's responses were non-verbal, closed and spontaneous. The four possible outcomes were two negative emotions (sad/scared, sad/angry, or scared/angry) and two non-negative emotions (happy/just alright). The position of the correct response was varied systematically among each of the four positions across test items. Control questions were sometimes introduced to check children's comprehension of the situation. Two versions of the picture book were constructed, one each for boys and girls. Only the boys' version is reported here (the stories for girls were identical—only the protagonists' names were changed).

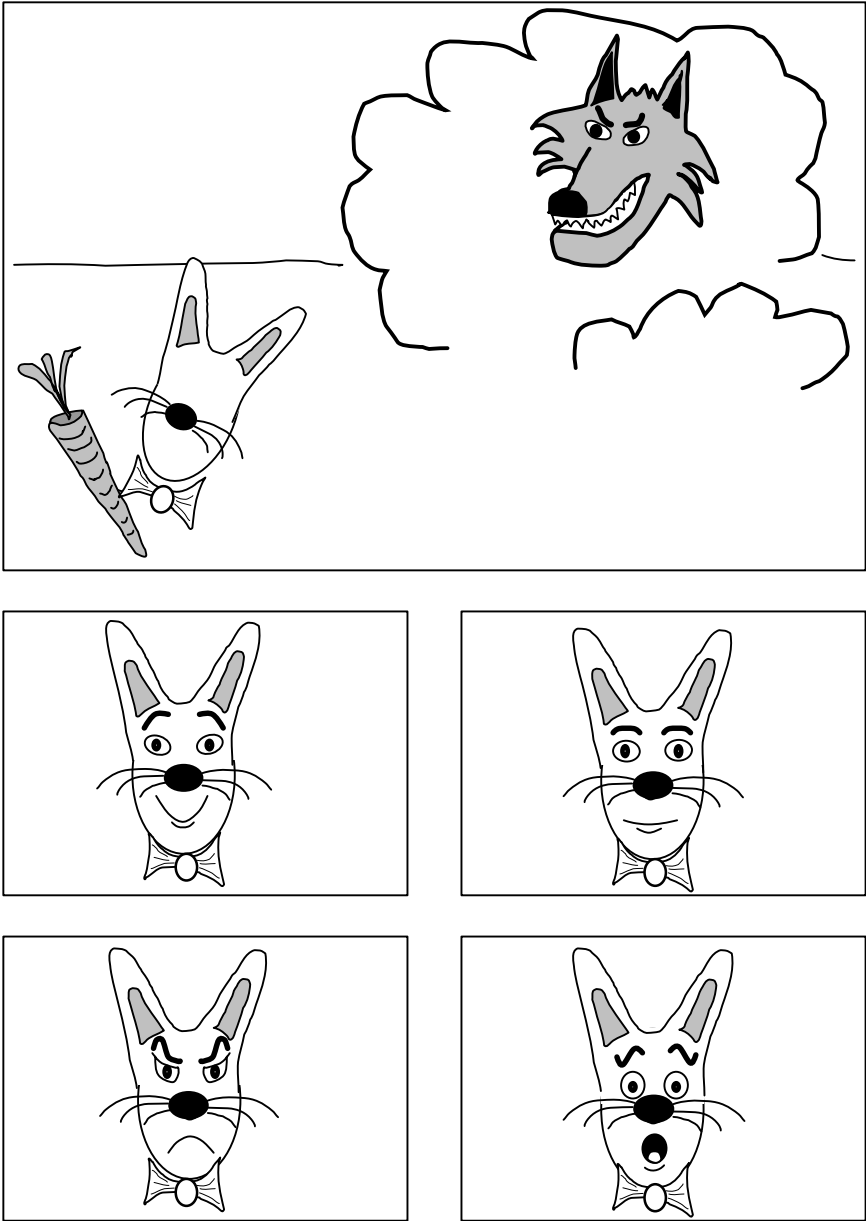


Figure 2. Example of cartoon scenario and emotional outcomes (Component IV: Belief). Note that children were invited to lift the cover concealing the fox and to replace it before their choice.

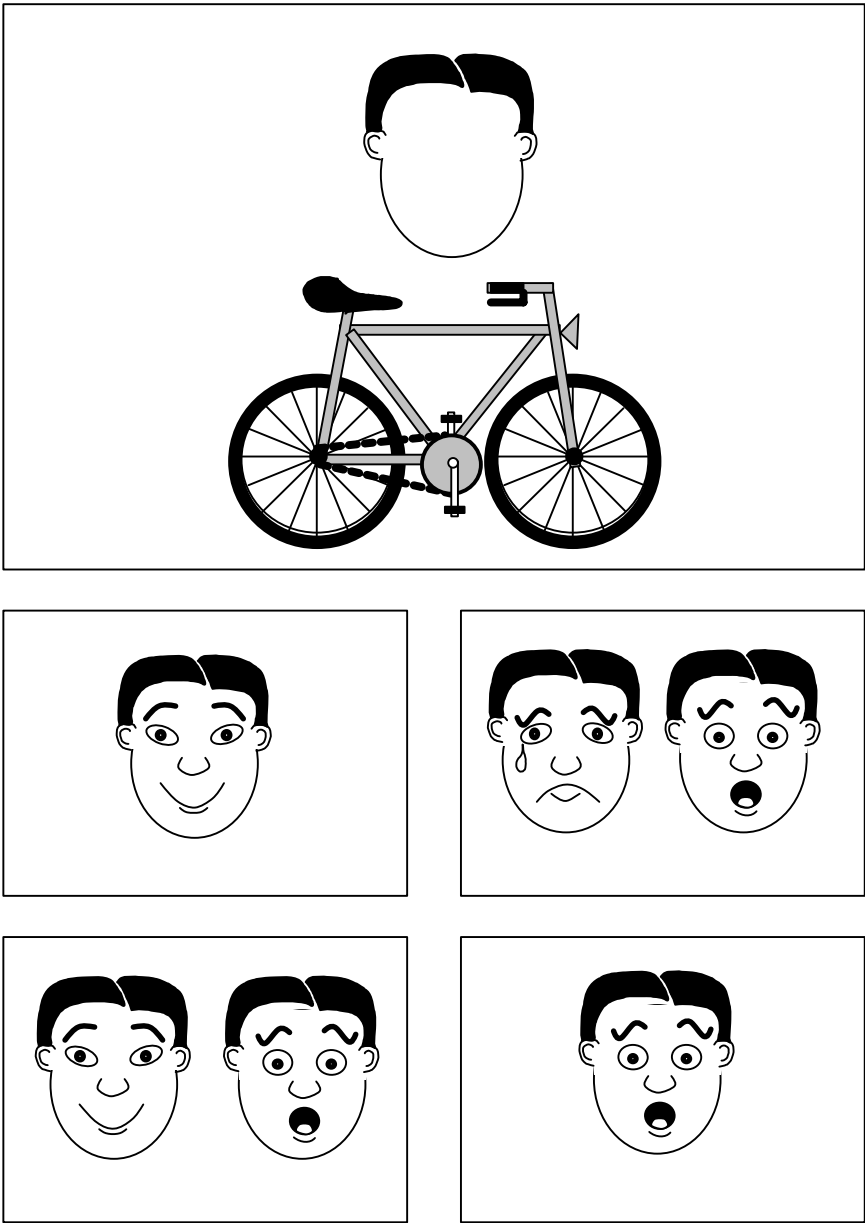


Figure 3. Example of cartoon scenario and emotional outcomes (Component VIII: Mixed).

Component I (Recognition)

Five successive test items were used to assess children's recognition of emotion on the basis of facial expression. For this component, exceptionally, no cartoon scenarios were used. Instead, the experimenter simply named an emotion and children had to point to the appropriate facial expression. For each of the five test items, four pictures representing different facial expressions were presented (in the lower half of the page). A different sheet was used for each item. The experimenter introduced the first item as follows: "Let's look at these four pictures. Can you point to the person who feels sad?" The four possible choices for the first item were happy, sad, angry and just alright. For the following four items, the emotions to be identified and the possible answers were: "happy" (happy, sad, just alright and scared); "angry" (happy, just alright, angry, and scared); "just alright" (happy, sad, angry and just alright); and, finally, "scared" (happy, just alright, angry and scared).

Component II (External cause)

Five successive test items were used to assess children's understanding of the external causes of emotions. The experimenter started by presenting the first item as follows: "This boy is looking at his little turtle, which has just died." Then, the experimenter asked: "How is this boy feeling? Is he happy, sad, angry or just alright?" The experimenter pointed to each of the four possible emotional outcomes. The procedure was the same for the subsequent four items. Only the situation depicted in the scenario and the four possible outcomes were changed. These were as follows: "This boy is getting a birthday present. How is this boy feeling?" (happy, sad, just alright or scared); "This boy is trying to do a drawing but his little brother is stopping him. How is this boy feeling?" (happy, just alright, angry or scared); "This boy is standing at the bus stop. How is this boy feeling?" (happy, sad, angry or just alright); and, finally, "This boy is being chased by a monster. How is this boy feeling?" (happy, just alright, angry or scared). The experimenter pointed to each outcome as it was articulated. This procedure was adopted for each of the remaining components described below.

Component III (Desire)

To assess understanding of desire-based emotion children had to acknowledge the perspectives of two protagonists who had opposing desires for lettuce. In the initial cartoon scenario, Tom and Peter stood on either side of a closed box with a removable door. The experimenter started by describing

the situation: "This is Tom and this is Peter. Tom hates lettuce and Peter likes lettuce very much." To check that children remembered the story details the experimenter then asked: "Does Tom like lettuce? Does Peter like lettuce?" If children's answers were correct the experimenter said: "That is right, Tom does not like lettuce," and/or "That is right, Peter likes lettuce." If children's answers were incorrect, the experimenter offered a correction by saying: "Well, actually, Tom does not like lettuce," and/or "Well actually, Peter likes lettuce." The rest of the narrative was as follows: "Can you open the box for me?" (Children were invited to lift a flap to reveal the contents of the box). "There is lettuce in the box. How is Tom feeling? Is he happy, sad, just alright or scared? And how is Peter feeling? Is he happy, sad, just alright or scared?"

Component IV (Belief)

Children were asked to make an emotion attribution to a protagonist who held a false belief. The initial cartoon scenario depicted a rabbit eating a carrot in the foreground and a bush in the background. Behind the bush a fox was hiding but this was not immediately obvious to the child. First, the experimenter described the situation: "This is Tom's rabbit. He is eating a carrot. He likes carrots very much. Can you look behind the bushes?" Children were invited to lift the flap depicting the bushes to reveal a fox. The narrative continued: "It's a fox. The fox is hiding behind the bushes because he wants to eat the rabbit. Can you put the bushes back on so that the rabbit can't see the fox." Then, the child was asked the false belief question: "Does the rabbit know the fox is hiding behind the bushes?" If children answered correctly, the experimenter said: "That's right, the rabbit doesn't know the fox is hiding behind the bushes." If children answered the false belief question incorrectly, the experimenter offered a correction by saying: "Well, actually, the rabbit does not know the fox is hiding behind the bushes." It was therefore possible in this procedure for the child to pass the subsequent emotion attribution question even if they failed the test of false belief understanding. Finally, the experimenter asked the emotion attribution question: "How is the rabbit feeling? Is he happy, just alright, angry or scared?"

Component V (Reminder)

Component V exploited the tragedy of Component IV (the rabbit was eaten by the fox) to test children's understanding of the influence of a reminder on the protagonist's present emotional state. In the initial cartoon scenario, Tom was crying and the fox, having eaten the rabbit,

had a fat belly. The experimenter explained: "Tom is very sad because the fox ate his rabbit." A second cartoon scenario followed in which Tom was sleeping: "Later on that night Tom goes to bed. The next day ... " Then, a third cartoon scenario in which Tom looked at a picture of his best friend was presented: "Tom is looking at his photo album. He is looking at a picture of his best friend." The experimenter asked: "How is Tom feeling? Is he happy, sad, alright or scared?" This question was introduced to determine if the child would respond to the novel situation (looking at a picture of his best friend) or if he would merely persevere by repeating the last emotion seen on Tom's face (i.e., sadness). Then, a fourth, and final, scenario was presented in which Tom was looking at a picture of his rabbit. The child was asked: "Now, Tom is looking at a picture of his rabbit. How is Tom feeling now? Is he happy, sad, alright or scared?"

Component VI (Regulation)

The item testing this component again capitalized on Tom's sadness at having lost his rabbit. The child was asked to consider how Tom might prevent himself from feeling sad and, hence, control the experience of his emotions. A cartoon scenario was presented showing tears in Tom's eyes while he looked at a picture of his rabbit. The experimenter said: "Tom is looking at a picture of his rabbit. Tom is very sad because his rabbit was eaten by the fox." For this item, exceptionally, the experimenter did not point to each of four possible emotional outcomes but instead to a depiction of each of the four possible regulation strategies. Thus, the experimenter continued: "What is the best way for Tom to stop himself being sad? Can Tom cover his eyes to stop himself being sad? Can Tom go outside and do something else to stop himself being sad? Can Tom think about something else to stop himself being sad? Or, is there nothing Tom can do to stop himself being sad?"

Component VII (Hiding)

This component assessed whether children understand that one can hide an underlying, or true, emotional state. In the cartoon scenario, Tom was trying to conceal his anger while being teased. The scenario was explained to the child as follows: "This is Tom and this is Daniel. Daniel is teasing Tom because Daniel has lots of marbles and Tom does not have any. Tom is smiling because he does not want to show Daniel how he is feeling inside." Finally, the experimenter asked: "How is Tom really feeling inside? Is he feeling happy, just alright, angry or scared?"

Component VIII (Mixed)

The understanding of mixed emotions was assessed with a cartoon scenario likely to provoke ambivalent feelings in the protagonist. Tom was looking at his new bicycle. The experimenter explained: "Tom is looking at the new bicycle that he just got for his birthday. But at the same time, Tom thinks he might fall off and hurt himself because he has never ridden a bicycle before." Afterwards, the experimenter asked: "So, how is Tom feeling? Is he happy; sad and scared; happy and scared; or scared?" For the second and third outcomes, two facial expressions were depicted side by side in the same frame.

Component IX (Morality)

The final component addressed children's understanding of moral emotions by presenting them with a cartoon scenario in which the protagonist omits to confess a misdemeanour. In the first cartoon scenario Tom was depicted at the home of a friend, standing in front of a jar of chocolate biscuits. The experimenter asked the child if it was "okay" for Tom to take a chocolate biscuit without asking the permission of his mother's friend. If the child indicated that it was not okay, the experimenter said: "That's right, he should wait because it is naughty to take something without asking." If the child indicated that it was okay to take a chocolate biscuit, the experimenter offered a correction by saying: "Well actually, he should wait because it is naughty to take something without asking." Having established that it would be wrong to take a biscuit, the child was told: "Tom can't stop himself from eating a chocolate biscuit." Subsequently, a further cartoon scenario depicted Tom in front of his mother. The child was asked: "Later, Tom goes home. Tom remembers that he ate a chocolate biscuit without asking. He wonders if he should tell his mummy about it. He tells his mummy about playing with his friend but in the end he never tells her about taking the chocolate biscuit. How does Tom feel about that? Does he feel happy about not telling his mummy? Does he feel sad about not telling his mummy? Does he feel angry about not telling his mummy? Does he feel just alright about not telling his mummy?"

Scoring

A general level of emotion understanding was determined by assigning a maximum of one point for each component answered correctly. This produced a maximum of 9 points (success on each component) and a minimum of 0 points (failure on each component). The scoring of each component was as follows. Component I (Recognition) included five test

items. Children were given a single point if they were correct on at least four of the five items. The correct outcomes were, in order: “sad”, “happy”, “angry”, “just alright,” and “scared.” Note that children were given no credit for selecting the incorrect expression of the same valence as the correct expression. Component II (External cause) also included five test items. Children were again given a single point if they were correct on at least four of the five items. The correct outcomes were, in order, “sad” (the protagonist’s turtle just died), “happy” (the protagonist is getting a birthday present), “angry” (the protagonist is being annoyed by his little brother), “just alright” (the protagonist is standing at the bus stop), and “scared” (the protagonist is chased by a monster). For Component III (Desire), the correct outcomes were “sad” (Tom does not like lettuce), and “happy” (Peter likes lettuce). Children received a single point if they answered both items correctly. For Component IV (Belief), the correct outcome was “happy” (the rabbit is enjoying the carrots, oblivious of the fox). For Component V (Reminder), the correct outcome was “sad” (the protagonist is reminded of the rabbit’s demise). For Component VI (Regulation), the correct outcome was “Tom can think about something else to stop himself being sad.” For Component VII (Hiding), the correct outcome was “angry” (although Tom is smiling, he really feels angry at Daniel’s teasing). For Component VIII (Mixed), the correct outcome was “happy and scared” (Tom has just received his first bicycle but fears that he might hurt himself). Finally, the correct outcome for Component IX (Morality) was “sad” (Tom is upset at not having confessed to his mother).

RESULTS

The results are presented in two parts. First, age changes with respect to each of the nine components are examined with attention to potential developmental periods. Second, the relationships among the nine components and their potential hierarchical organization are analyzed.

Developments of the nine components

Table 1 shows the mean general level of emotion understanding by age. A 2-way ANOVA of Age \times Gender revealed no significant effect of gender but a highly significant effect of age, $F(4, 90) = 72.23$; $p < .001$. There was a fairly linear improvement in general level of emotion understanding as a function of age. Post-hoc contrast analyses (Tukey’s HSD procedure) showed that differences between age groups were all significant.

Table 2 shows the percentage of children succeeding by component and age. Table 2 also indicates the results of the Kruskal–Wallis one-way analyses of variance, which were carried out to assess the effect of age for

TABLE 1
Mean (and standard deviation) of the general level of emotion understanding by age

Age	n	General level of emotion understanding
		<i>M (SD)</i>
3 years	20	1.90 (1.33)
5 years	20	4.20 (1.76)
7 years	20	5.80 (1.73)
9 years	20	7.30 (0.97)
11 years	20	8.55 (0.82)

TABLE 2
Percentage of children succeeding by component and age

Age	n	Component								
		<i>I</i>	<i>V</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>VII</i>	<i>VIII</i>	<i>VI</i>	<i>IX</i>
3 years	20	55	45	30	20	20	5	5	0	10
5 years	20	75	80	65	55	40	50	15	20	20
7 years	20	90	80	100	75	85	65	20	35	30
9 years	20	100	100	100	80	95	80	65	60	50
11 years	20	100	100	100	100	100	95	90	80	90
K-W		21.66***	25.99***	46.79***	32.38***	46.68***	39.04***	44.69***	33.46***	33.00***

K - W = $\chi^2(4)$ of Kruskal - Wallis; *** $p < .001$.

each component. Inspection of Table 2 confirms that the age effect was significant for all nine components although improvement was much slower for some components than for others.

Just over half the 3 year olds (55%) were able to recognize different emotions on the basis of facial expression (Component I). By contrast, three quarters (75%) of the children passed this component by 5 years.

From the age of 5 years a majority of the children were able to understand the role of reminders on emotion (80%) (Component V), to correctly identify external causes of emotions (65%) (Component II), and to understand that two characters in the same situation can feel different emotions because they have different desires (55%) (Component III).

From the age of 7 years a majority of the children were able to understand the influence of beliefs on emotions (85%) (Component IV), and the distinction between expressed and actual, felt emotion (65%) (Component VII).

From the age of 9 years a majority of the children (65%) were able to understand that a character in the same situation can feel ambivalent mixed

emotions (Component VIII), and that it is possible to regulate emotion via a cognitive strategy (60%) (Component VI).

Finally, at the age of 9 years half the children (50%) were able to understand that the failure to confess a misdemeanour provokes sadness (Component IX). At 11 years, the overwhelming majority (90%) understood this connection.

Relationships among the nine components

Table 3 shows the mean score for success by component (rank-ordered by difficulty). A two-way ANOVA of Component \times Gender confirmed the main effect of component, $F(8, 784) = 25.76$; $p < .001$. Gender was not significant. Contrast analyses (paired samples t -tests comparing scores on each pair of components) showed that the nine components could be divided into three groups, with each group composed of three components. In the first and "easy" group were the components I (Recognition), V (Reminder), and II (External cause). The overall mean level of success for children on these three components was 0.81. In the second and "intermediate" group were the components IV (Belief), III (Desire), and VII (Hiding). The overall mean level of success for children on these three components was 0.64. Finally, in the third and "difficult" group were the components IX (Morality), VI (Regulation), and VIII (Mixed); the overall mean level of success for children on these three components was 0.39.

The results of the contrast analyses are presented in Table 4. Inspection of Table 4 reveals that pair-wise differences between the components within each group were not significant whereas all other pair-wise differences were significant.

Table 5 shows for each possible pair of components the percentage of children who failed both, passed both, or passed one but not the other.

TABLE 3
Mean level of success (and standard deviation) by component

<i>Component</i>	<i>n</i>	<i>Success M (SD)</i>
Component I (Recognition)	100	.84 (.36)
Component V (Reminder)	100	.81 (.39)
Component II (Cause)	100	.79 (.40)
Component IV (Belief)	100	.68 (.46)
Component III (Desire)	100	.66 (.47)
Component VII (Hiding)	100	.59 (.49)
Component IX (Morality)	100	.40 (.49)
Component VI (Regulation)	100	.39 (.49)
Component VIII (Mixed)	100	.39 (.49)

TABLE 4
Contrast analyses (paired samples t-test) for each possible pair of components

Component	Component							
	V	II	IV	III	VII	IX	VI	VIII
I	0.65 ^{ns}	1.68 ^{ns}	3.44***	3.93***	5.00***	8.18***	8.35***	8.66***
V		0.45 ^{ns}	2.57**	3.28***	3.92***	7.19***	8.14***	8.47***
II			2.46*	3.11**	4.06***	7.11***	7.52***	7.52***
IV				0.43 ^{ns}	1.75 ^{ns}	5.45***	5.40***	5.40***
III					1.19 ^{ns}	4.78***	5.10***	4.93***
VII						3.61***	3.41***	3.63***
IX							0.17 ^{ns}	0.19 ^{ns}
VI								0.00 ^{ns}

* $p < .05$; ** $p < .01$; *** $p < .001$; ^{ns}non-significant.

TABLE 5
Percentage of children passing or failing for each possible pair of components

Component		Component															
		V		II		IV		III		VII		IX		VI		VIII	
		F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P
I	F	7	9	14	2	12	4	13	3	13	3	14	2	14	2	15	1
	P	12	72	7	77	20	64	21	63	28	56	46	38	47	37	46	38
V	F			10	9	12	7	15	4	12	7	15	4	18	1	19	0
	P			11	70	20	61	19	62	29	52	45	36	43	38	42	39
II	F					16	5	18	3	17	4	18	3	19	2	19	2
	P					16	63	16	63	24	55	42	37	42	37	42	37
IV	F							22	10	23	9	29	3	28	4	28	4
	P							12	56	18	50	31	37	33	35	33	35
III	F									20	14	29	5	30	4	29	5
	P									21	45	31	35	31	35	32	34
VII	F											35	6	32	9	34	7
	P											25	34	29	30	27	32
IX	F													44	16	47	13
	P													17	23	14	26
VI	F															46	15
	P															15	24

P, pass; F, fail.

Inspection of Table 5 shows that for almost all possible pairs, the majority of children tended to perform in one of two ways. Either they were consistent across both components—they passed or failed both. Alternatively, they were inconsistent—they passed one component and failed the other. Thus, it was rarely the case that children were distributed equally

TABLE 6
Association analyses (Pearson's χ^2) for each possible pair of components

Component	Component							
	V	II	IV	III	VII	IX	VI	VIII
I	7.58**	50.77***	16.19***	18.95***	12.76***	6.00**	5.62*	8.59**
V		14.15***	10.47***	21.12***	4.76*	4.50*	11.22***	15.00***
II			23.86***	31.68***	17.54***	7.32**	9.71**	9.71**
IV				25.32***	18.54***	18.39***	13.89***	13.89***
III					6.77**	13.73***	16.06***	12.78***
VII						18.63***	8.49**	14.04***
IX							9.59**	18.94***
VI								13.64***

* $p < .05$; ** $p < .01$; *** $p < .001$.

across all four possible outcomes. Table 6 confirms this conclusion. Pearson's χ^2 indices were significant in all cases. It was therefore legitimate to perform more precise analyses of these associations.

First, a scalogram analysis (Green, 1956; Guttman, 1950) was carried out to examine at a general level the hierarchical relationship among the nine components. Two statistics were calculated: the Index of Consistency (I) and the Coefficient of Reproducibility (R). These values vary from 0 to 1. Using conventionally accepted criteria (Green, 1956) the components may be considered scalable if I is greater than 0.500 and the scale valid if R is greater than 0.900. The scalogram analysis produced an I of 0.676 and an R of 0.904. This suggested that at a general level the nine components are scalable and that the scale is valid.

Next, prediction analyses (Hildebrand, Laing, & Rosenthal, 1977) were carried out to examine more precisely the relationships between the children's answers to each possible pair of components. This type of analysis allowed us to assess which model or models best described these relationships. Three models were tested. In Model 1, success on component X of the pair implied success on component Y of the pair, and reciprocally, failure on component X implied failure on component Y ($X = Y$). In this first model, each child who passed one of the components of the pair and failed the other one was considered as a datum refuting the model. In Model 2, success on component X of the pair was a necessary but not sufficient condition for success on component Y of the pair ($X \rightarrow Y$). In this second model, each child who passed component Y and failed component X was considered as a datum refuting the model. Finally, in Model 3 the postulated relationship was the opposite of Model 2: Success on component Y was a necessary but not sufficient condition for success on component X ($X \leftarrow Y$). Each child who passed component X and failed component Y was

considered as a datum refuting this third model. The prediction analyses were divided into two steps. In the first step, the three models were tested separately. For each one, a statistic was computed: the Del index. This index could vary from $+1$ to $-\infty$. A value of $+1$ means that there was a perfect fit between the model and the data, whereas a negative value showed that chance is a better predictor than the model. In the second step, the remaining statistically significant models were compared to establish which one was significantly better than the other(s).

The prediction analyses showed that the nine components could be divided into three groups (See Table 7 for the outcome of the Del indices). These groups were identical to those previously reported in connection with the pair-wise *t*-tests among the nine components: First (Components I, II, V), Second (Components III, IV, VII) and Third (Components VI, VIII, IX).

Within each one of these groups, it was not possible to decide which one of the three models (Model 1: $X = Y$; Model 2: $X \rightarrow Y$; Model 3: $X \leftarrow Y$)

TABLE 7
Prediction analyses (Del) for each possible X-Y pair of components

Model		Component Y							
Component X	1, 2 & 3	V	II	IV	III	VII	IX	VI	VIII
I	$X = Y$	.27*	.70***	ns	ns	ns	ns	ns	ns
	$X \rightarrow Y$	.31*	.84***	.63***	.72***	.68***	.69***	.68***	.84***
	$X \leftarrow Y$	.25*	ns	ns	ns	ns	ns	ns	ns
V	$X = Y$		.38**	ns	ns	ns	ns	ns	ns
	$X \rightarrow Y$		.40**	.46***	.68***	.38**	.47***	.87***	1.00***
	$X \leftarrow Y$		.35**	ns	ns	ns	ns	ns	ns
II	$X = Y$			ns	ns	ns	ns	ns	ns
	$X \rightarrow Y$			.65***	.78***	.68***	.64***	.76***	.76***
	$X \leftarrow Y$			ns	ns	ns	ns	ns	ns
IV	$X = Y$				.50***	.42***	ns	ns	ns
	$X \rightarrow Y$				.53***	.52***	.77***	.68***	.68***
	$X \leftarrow Y$				.48***	ns	ns	ns	ns
III	$X = Y$					.26*	ns	ns	ns
	$X \rightarrow Y$					.30*	.63***	.70***	.62***
	$X \leftarrow Y$					.22*	ns	ns	ns
VII	$X = Y$						ns	ns	ns
	$X \rightarrow Y$						.63***	.44***	.56***
	$X \leftarrow Y$						ns	ns	ns
IX	$X = Y$							.31*	.44***
	$X \rightarrow Y$							.31*	.44***
	$X \leftarrow Y$							.30*	.43***
VI	$X = Y$								.37**
	$X \rightarrow Y$								.36**
	$X \leftarrow Y$								.36**

* $p < .05$; ** $p < .01$; *** $p < .001$; ns = non significant.

best described the relationships between any given pair of components within that group. In general, all three models were significant and the value of their Del index positive and similar. Effectively, the relationships between the answers of the children to these "intra-group" components were more correlational than implicative. Thus, success on any given component was not a prerequisite for success on the two other intra-group components.

The situation was more clear-cut with respect to the relationships between the components from one group and the components of the other groups. The relationship between the answers of the children on these "inter-group" components was always implicative, rather than simply correlational, in that success on the components of the first group was a necessary, albeit not a sufficient, condition for success on the components of the second and third groups. Similarly, success on the components of the second group was a necessary, albeit not a sufficient, condition for success on the components of the third group (first group → second group → third group).

To verify this last result, a final analysis was performed. First, each group of components was considered as "passed" by the child when he/she passed at least 2 components of the group. Second, the "successes" or the "failures" of the children in each group of components were then compared. Almost all children (95%) confirmed the implicative relationships found before. They "passed" either none of the three groups of components (18%), only the first group (14%), the first and second groups (27%), or all three groups of components (36%). Only 5% of the children produced a pattern of answers that did not fit the "inter-group" implicative model.

DISCUSSION

The first goal of this research was to examine, using a single, consistent methodology, the development of the nine components of emotion understanding identified in the literature. More precisely, the goal was to assess the relative difficulty of the components, and to see if distinct developmental periods exist that can be characterized by the emergence of an understanding of specific components.

The findings showed that children's general level of emotion understanding (across the nine components) developed very clearly and quite regularly between the ages of 3 and 11 years. Almost all of the youngest children (aged 3 years) passed 2 components and almost all of the oldest children (aged 11 years) passed 8 or 9 components.

Moreover, although children mastered different components at different ages, there was a clear development with respect to each component between 3 and 11 years. At the age of 3 years, just over half the children were able to recognize a minimum of four out of five emotions on the basis of their facial

expression (Component I). From the age of 5 years, a clear majority of the children was able to recognize different emotional expressions, to identify correctly some of their external causes, and to understand the impact of reminders on emotion (components I, II and V). From the age of 7 years, a clear majority of the children was able to understand the role of desires, the role of beliefs, and also the possibility of hiding emotion (components III, IV and VII). Finally, between the ages of 9 and 11 years, a clear majority was able to understand the mixed nature of emotions, the possibility of regulating emotion via cognition, and the influence of morality on emotions (components VIII, VI and IX).

Further analysis showed that the development of the nine components of emotion understanding in children can be plausibly divided into three developmental periods, each one being characterized by the emergence of a group of three components. The first period (around 5 years) is characterized by the understanding of important public aspects of emotions: their situational causes; their outward expression; and those events or objects that serve as external prompts or reminders that reactivate emotion. The second period (around 7 years) is characterized by the understanding of the mentalistic nature of emotions: the connection to desires and beliefs; and the distinction between expressed and felt emotion. Finally, the third period (around 9–11 years) is characterized by an understanding of how an individual can reflect upon a given situation from various perspectives and thereby trigger different feelings either concurrently or successively: conflicting feelings; distress at a failure to confess; and the cognitive regulation of emotion.

The second goal of this research was to examine the relationships among the nine components of emotion understanding. More precisely, a hierarchical analysis was carried out to see whether some components were a necessary condition (even if not a sufficient condition) for the emergence of other components. Further analysis showed that the nine components could be divided into three groups. These groups were equivalent to those that emerged from the developmental analyses. The relationships among the components within each group were always correlational whereas the relationships among the components from separate groups were always implicative.

These results suggest that the different components of emotion understanding are hierarchically organized. Initially, children focus on the external aspects of emotion: facial expressions; external causes; and the impact of associated external events or reminders. Each type of understanding emerges concurrently with the others.

The situation is similar within the second group. The understanding of the various mental aspects of emotion—the role of desires and of beliefs and the distinction between expressed and felt emotion—appears to emerge

concurrently. Within the third group, children's understanding of the way in which an individual can think about a particular emotionally charged event from more than one perspective leads to a concurrent appreciation of mixed feelings, cognitive control strategies and the effect of rumination about an unacknowledged misdemeanour. These three groups suggest a causal organization: understanding key external aspects of emotion (first group) is a prerequisite for understanding more psychological aspects of emotions (second group). In turn, understanding these internal aspects is a prerequisite for understanding the impact of reflection and rumination on emotions (third group).

In the introduction, the approximate age at which children understand a given component was identified in light of the existing literature. In general, the findings of the present study are quite consistent with those earlier reports. However, two discrepancies warrant discussion. First, children performed somewhat better than expected on Component V (Reminder). Almost half of the 3 year olds (45%) and a clear majority of 5 year olds (80%) passed this item. The most straightforward explanation of this finding is that, on reflection, the considerable success of these young children is actually consistent with existing findings. Lagattuta and her colleagues report that preschoolers understand the emotional effect of reminders that are very similar, or closely related, to the original situational elicitor (Lagattuta et al., 1997). This fits the present findings because the reminder was a picture of the lost pet. Second, the findings for Component III (Desire) were unexpected in that younger children performed inaccurately. A small proportion of 3 year olds (20%) and less than half of the 5 year olds (45%) passed this item. A plausible explanation for this relatively low level of success is that children were given credit only if they acknowledged the conflicting emotional reactions of the two story characters. Thus, children who judged one protagonist to be "happy", and the other to be "just alright" received no credit. Scrutiny of the existing literature again shows that, when viewed in this light, the observed pattern is not so unexpected. Both Moore et al. (1995) and Perner, Zauner and Sprung (in press) report that preschoolers find it difficult to acknowledge desires that are in mutual opposition to one another; indeed performance is no better than on standard tests of false belief. Similarly, Harris (1991) found that autistic children performed no better on a test of conflicting desires than on a false-belief task.

In sum, despite the relatively brief assessment of each component, children's performance in the present study was mostly compatible with earlier findings. Nevertheless, several limitations to our testing procedure should be noted. First, all the children came from various schools within one particular city of the United Kingdom. In follow-up studies, however, we have obtained very similar findings with children from different cities

and different European countries (Pons, Lawson, Harris, & de Rosnay, 2003; Doudin, Pons, & Pfulg, 2002). Second, the test–retest reliability of the procedure was not assessed in the present study but a separate study involving 9 year olds has shown a high test–retest correlation (.84) with a 3-month delay (Pons, Harris, & Doudin, 2002). Third, in order to maintain children’s interest and to test them on all nine components, the testing of each component was necessarily brief. More specifically, only one vignette and one emotion was used to assess children’s understanding of components III–IX. From a psychometric point of view, this procedure has important limitations. Arguably, the relative difficulty of the components would be different if the particular vignettes or the choice of correct emotion were altered. Although we concede this point, it should be emphasized that performance of the different age groups on each component is, as noted above, largely consistent with what has been reported in the literature using several items per component. Nevertheless, in future research, we plan to compare children’s performance on different variants of each component.

CONCLUSION

At a theoretical level, this research draws together a relatively disparate set of investigations of children’s understanding of various emotions. It suggests that it is helpful to think in terms of three developmental periods, each period being characterized by the consolidation of a particular mode of understanding (external, mentalistic, and reflective appraisal). The research also indicates that the child’s understanding is organized in a hierarchical fashion, with the earlier mode of understanding being a necessary if not a sufficient condition for the emergence of later modes.

At a practical level, the assessment procedure used in this research could be a first step toward the construction of a standardized test of understanding. A standardized test would permit the researcher or clinician to locate a child in terms of emotional understanding with respect to his or her reference population. This localization could be either general (with respect to the child’s general level of emotion understanding) or more specific (with respect to the child’s understanding of each one of the nine different components). Such an instrument would also allow children’s understanding of emotion to be systematically introduced as either an explanatory variable or as a variable to be explained both in clinical and developmental psychology—e.g., in the context of attachment, theory of mind, metacognition, language, individual differences, social behaviours and representations, learning difficulties, family background or experienced emotions (for a discussion see e.g., Pons, Doudin, Harris, & de Rosnay, 2002).

In this connection, it is worth emphasizing that recent longitudinal research has shown that there are marked individual differences even among normal children in their understanding of emotion. Such differences appear to be associated with earlier variation in the child's family environment (Dunn, Brown, & Beardsall, 1991; Dunn, Brown, Slomkowski, Telsa, & Youngblade, 1991; Steele, Steele, Fonagy, Croft, & Holder, 1999). However, because such research has typically used a relatively small battery of experimental tasks, it is difficult to gauge whether such individual differences are pervasive and persistent. The development of a standardized test would not only allow different laboratories to more easily compare their findings, it would also enable them to ask whether such individual differences are pervasive—insofar as they are stable across components within a given developmental period—as well as persistent—insofar as they remain stable across components belonging to successive periods.

REFERENCES

- Altshuler, J., & Rubble, D. (1989). Developmental changes in children's awareness of strategies for coping with uncontrollable stress. *Child Development*, 60, 1337–1349.
- Arsenio, W., & Lover, A. (1999). *Children's conceptions of sociomoral affect: Happy victimizers, mixed emotions, and other expectancies*. New York: Cambridge University Press.
- Band, E., & Weisz, J. (1988). How to feel better when it feels bad: Children's perspectives on coping with everyday stress. *Developmental Psychology*, 24, 247–253.
- Barden, R., Zelco, F., Duncan, S., & Masters, J. (1980). Children's consensual knowledge about the experiential determinants of emotion. *Journal of Personality and Social Psychology*, 39, 968–976.
- Borke, H. (1971). Interpersonal perception of young children: Egocentrism or empathy? *Developmental Psychology*, 5, 263–269.
- Bradmetz, J., & Schneider, R. (1999). Is Little Red Riding Hood afraid of her grandmother? Cognitive vs. emotional response to a false belief. *British Journal of Developmental Psychology*, 17, 501–514.
- Brown, J. R. & Dunn, J. (1996). Continuities in emotion understanding from three to six years. *Child Development*, 67, 789–802.
- Bullock, M., & Russell, J. A. (1985). Further evidence on preschoolers' interpretation of facial expressions. *International Journal of Behavioral Development*, 8, 15–38.
- Cook, E. T., Greenberg, M. T., & Kusché, C. A. (1994). The relations between emotional understanding, intellectual functioning, and disruptive behavior problems in elementary-school-aged children. *Journal of Abnormal Child Psychology*, 22, 205–219.
- Cutting, A., & Dunn, J. (1999). Theory of mind, emotion understanding, language, and family background: Individual differences and interrelations. *Child Development*, 70, 853–865.
- Denham, S. (1986). Social cognition, prosocial behavior, and emotion in preschoolers: Contextual validation. *Child Development*, 57, 194–201.
- Donaldson, S., & Westerman, M. (1986). Development of children's understanding of ambivalence and causal theories of emotion. *Developmental Psychology*, 22, 655–662.
- Doudin, P.-A., Pons, F., & Pfulg, L. (2002). Enfants abusés: un exemple de partenariat entre une institution spécialisée et un établissement scolaire. In G. Petitpierre (Ed.), *Enrichir les compétences* (pp. 55–64). Lucerne: Edition SZH/SPC.

- Dunn, J., Brown, J. & Beardsall, L. (1991). Family talk about feeling states and children's later understanding of others' emotions. *Developmental Psychology*, 27, 448–455.
- Dunn, J., Brown, J., Slomkowski, C., Tesla, C., & Youngblade, L. (1991). Young children's understanding of other people's feelings and beliefs: Individual differences and their antecedents. *Child Development*, 62, 1352–1366.
- Fabes, R., Eisenberg, N., Nyman M., & Michaelieu, Q. (1991). Young children's appraisals of others' spontaneous emotional reactions. *Developmental Psychology*, 27, 858–866.
- Fischer, K., Shaver, P., & Carnochan, P. (1990). How emotions develop and how they organize development. *Cognition and Emotion*, 4, 81–127.
- Fonagy, P., Redfern, S., & Charman, T. (1997). The relationship between belief–desire reasoning and a projective measure of attachment security (SAT). *British Journal of Developmental Psychology*, 15, 51–61.
- Gardner, D., Harris, P., Ohmoto, M., & Hamazaki, T. (1988). Japanese children's understanding of the distinction between real and apparent emotion. *International Journal of Behavioral Development*, 11, 203–218.
- Green, B. (1956). A method of scalogram analysis using summary statistics. *Psychometrika*, 21, 79–88.
- Gross, D., & Harris, P. (1988). Understanding false beliefs about emotion. *International Journal of Behavioral Development*, 11, 475–488.
- Guttman, L. (1950). The basis for scalogram analysis. In S. Stouffer, L. Guttman, E. Suchman, P. Lazarsfeld, S. Star, & J. Clausen (Eds.), *Measurement and prediction* (pp. 60–90). Princeton: Princeton University Press.
- Hadwin, J., & Perner, J. (1991). Pleased and surprised: Children's cognitive theory of emotion. *British Journal of Developmental Psychology*, 9, 215–234.
- Harris, P. L. (1983). Children's understanding of the link between situation and emotion. *Journal of Experimental Child Psychology*, 36, 1–20.
- Harris, P. L. (1989). *Children and emotion: The development of psychological understanding*. Oxford: Blackwell.
- Harris, P. L. (1991). The work of the imagination. In A. Whiten (Ed.), *Natural theories of mind: Evolution, development and simulation of everyday mind reading* (pp. 283–304). Oxford: Oxford University Press.
- Harris, P. L. (2000). Understanding emotion. In M. Lewis & J. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 281–292). New York: The Guilford Press.
- Harris, P. L., Donnelly, K., Guz, G., & Pitt-Watson, R. (1986). Children's understanding of the distinction between real and apparent emotion. *Child Development*, 57, 895–909.
- Harris, P. L., Guz, G., Lipian, M., & Man-Shu, Z. (1985). Insight into the time course of emotion among Western and Chinese children. *Child Development*, 56, 972–988.
- Harris, P. L., Johnson, C., Hutton, D., Andrews, G., & Cooke, T. (1989). Young children's theory of mind and emotion. *Cognition and Emotion*, 3, 379–400.
- Harris, P. L., & Lipian, M. (1989). Understanding emotion and experiencing emotion. In C. Saarni & P. Harris (Eds.), *Children's understanding of emotion* (pp. 241–258). New York: Cambridge University Press.
- Harris, P. L., Olthof, T., & Meerum Terwogt, M. (1981). Children's knowledge of emotion. *Journal of Child Psychology and Psychiatry*, 22, 247–261.
- Harris, P. L., Olthof, T., Meerum Terwogt, M., & Hardman, C. (1987). Children's knowledge of the situations that provoke emotion. *International Journal of Behavioral Development*, 10, 319–343.
- Harter, S., & Buddin, B. (1987). Children's understanding of the simultaneity of two emotions: A five-stage acquisition sequence. *Developmental Psychology*, 23, 388–399.

- Harter, S., & Whitesell, N. (1989). Developmental changes in children's emotion concepts. In C. Saarni & P. L. Harris (Eds.), *Children's understanding of emotions* (pp. 81–116). New York: Cambridge University Press.
- Harter, S., Wright, K., & Bresnick, S. (1987). *A developmental sequence of the understanding of pride and shame*. Paper presented at the Society for Research in Child Development Biennial Meeting, Baltimore, MD, April.
- Hildebrand, D., Laing, J., & Rosenthal, H. (1977). *Prediction analysis of cross-classifications*. New York: John Wiley.
- Hughes, C., & Dunn, J. (1998). Understanding mind and emotion: Longitudinal associations with mental-state talk between young friends. *Developmental Psychology*, 34, 1026–1037.
- Jones, D. C., Abbey, B. B., & Cumberland, A. (1998). The development of display rule knowledge: Linkages with family expressiveness and social competence. *Child Development*, 69, 1209–1222.
- Joshi, M., & MacLean, M. (1994). Indian and English children's understanding of the distinction between real and apparent emotion. *Child Development*, 65, 1372–1384.
- Kestenbaum, R., & Gelman, S. (1995). Preschool children's identification and understanding of mixed emotions. *Cognitive Development*, 10, 443–458.
- Lagattuta, K., & Wellman, H. (2001). Thinking about the past: Early knowledge about links between prior experience, thinking and emotion. *Child Development*, 72, 82–100.
- Lagattuta, K., Wellman, H., & Flavell, J. (1997). Preschoolers' understanding of the link between thinking and feeling: Cognitive cueing and emotional change. *Child Development*, 68, 1081–1104.
- Lake, N., Lane, S., & Harris, P. L. (1995). The expectation of guilt and resistance to temptation. *Early Development and Parenting*, 4, 63–73.
- Manstead, A. (1994). Children's understanding of emotion. In J. Russell, J.-M. Fernandez-Dols, A. Manstead, & J. Wellenkamp (Eds.), *Everyday conceptions of emotions* (pp. 315–331). Dordrecht: Kluwer.
- Meerum Terwogt, M., Koops, W., Oosterhoff, T., & Olthof, T. (1986). Development in processing of multiple emotional situations. *Journal of General Psychology*, 11, 109–121.
- Meerum Terwogt, M., & Stegge, H. (1995). Children's understanding of the strategic control of negative emotions. In J. Russell, J.-M. Fernandez-Dols, & A. Manstead (Eds.), *Everyday conceptions of emotions* (pp. 373–390). Dordrecht: Kluwer.
- Moore, C., Jarrold, C., Russell, J., Lumm, A., Sapp, F., & MacCallum, F. (1995). Conflicting desire and the child's theory of mind. *Cognitive Development*, 10, 467–482.
- Nunner-Winkler, G., & Sodian, B. (1988). Children's understanding of moral emotions. *Child Development*, 59, 1323–1338.
- Peng, M., Johnson, C., Pollock, J., Glasspool, R., & Harris, P. L. (1992). Training young children to acknowledge mixed emotions. *Cognition and Emotion*, 6, 387–401.
- Perner, J., Zauner, P., & Sprung, M. (in press). What does "That" have to do with points of view? Conflicting desires and the case of "Want" in German. In J. Astington & J. Baird (Eds.), *Why language matters for theory of mind*. Oxford: Oxford University Press.
- Pons, F., Doudin, P.-A., Harris, P., & de Rosnay, M. (2002). Métaémotion et intégration scolaire. In L. Lafortune & P. Mongeau (Eds.), *L'affectivité dans l'apprentissage* (pp. 7–28). Sainte-Foy: Presses de l'Université du Québec.
- Pons, F., Harris, P. L., & Doudin, P.-A. (2002). Teaching emotion understanding. *European Journal of Psychology of Education*, 17, 293–304.
- Pons, F., Harris, P. L., & de Rosnay, M. (2000). La compréhension des émotions chez l'enfant. *Psychoscope*, 21, 29–32.
- Pons, F., Lawson, J., Harris, P. L., & de Rosnay, M. (2003). Individual differences in children's emotion understanding: Effects of age and language. *Scandinavian Journal of Psychology*, 44, 347–353.

- Rothenberg, B. (1970). Children's social sensitivity and the relationship to interpersonal competence, intrapersonal comfort and intellectual level. *Developmental Psychology*, 2, 335–350.
- Saarni, C. (1979). Children's understanding of display rules for expressive behavior. *Developmental Psychology*, 15, 424–429.
- Saarni, C., Mumme, D., & Campos, J. (1998). Emotional development: Action, communication, and understanding. In: W. Damon (Series Ed.), & N. Eisenberg (Ed.), *Handbook of child psychology: Vol. 3. Social, emotional and personality development* (5th ed., pp. 237–309). New York: John Wiley.
- Steele, H., Steele, M., Fonagy, P., Croft, C., & Holder, J. (1999). Attachment predictors of children's understanding of emotion and mind in the sixth year. *Social Development*, 8, 161–178.
- Taylor, D., & Harris, P. L. (1983). Knowledge of strategies for the expression of emotion among normal and maladjusted boys: A research note. *Journal of Child Psychology and Psychiatry*, 24, 223–229.
- Yuill, N. (1984). Young children's co-ordination of motive and outcome in judgments of satisfaction and morality. *British Journal of Developmental Psychology*, 2, 73–81.

Manuscript received 13 May 2003

Manuscript accepted 9 September 2003