

# Understanding of Simple and Complex Emotions in Non-retarded Children with Autism

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*Abstract*—Non-retarded autistic children are compared to normal controls on measures of emotion expression and recognition. In general, autistic subjects recounted appropriate examples of simple and complex emotions, and accurately labeled relatively ambiguous affect expression in pictures. Autistic children manifested some difficulty talking about socially derived emotions, pride and embarrassment. They required more time and more prompts, their responses were more tentative and “scripted”, and they displayed limited understanding of the salience of others in embarrassing situations. Results are discussed in relation to theory of mind impairment and compensation strategies in autism.

*Keywords:* Autism-high functioning, emotion (complex), pride, embarrassment, audience

Although the subject of relatively little empirical study, questions concerning the prominence of affective impairment in autism have spawned a recent and growing body of research. The majority of these studies have examined affect expression and recognition in retarded autistic children and have focused on simple or primary emotions, such as happiness, sadness, anger and fear. To understand further the nature and pervasiveness of social-emotional deficits in autism, the present project investigated the ability of non-retarded autistic children to talk about and label both simple and complex emotions.

Studies of young retarded autistic children suggest that they are limited in the ability to recognize and communicate feeling states through facial expression (Weeks & Hobson, 1987; Langdell, 1981; Hobson, Ouston & Lee, 1988), gesture (Attwood, Frith & Hermelin, 1988) and vocalization (Ricks, 1975; Ricks & Wings, 1979). Autistic children have also been observed to show less positive emotion in certain social contexts

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than controls (Dawson, Galpert, Hill & Spencer, 1990; Kasari, Sigman, Yirmiya & Mundy, 1990; Snow, Hertzog & Shapiro, 1987; Yirmiya, Kasari, Sigman & Mundy, 1989).

Studies with slightly older retarded autistic children and controls (Hobson, 1986a,b) suggest that they have difficulty matching emotionally expressive faces, voices and gestures with each other and with affect-inducing situations. The differences are small, however, when the autistic children are compared with control children matched on language ability (Braverman, Fein, Lucci & Waterhouse, 1989; Prior, Dahlstrom & Squires, 1990; Ozonoff, Pennington & Rogers, 1990). Additionally, using a series of the aforementioned measures of emotion expression and recognition, MacDonald *et al.* (1989) found that non-retarded autistic adults performed less well than normal controls on the basis of composite scores, but not on any one individual test.

Participation of non-retarded, verbal autistic individuals permits investigation of emotion expression and comprehension in the context of social interaction. In one such study, non-retarded children with autism and normal controls were asked to identify the emotion experienced by the protagonist in videotaped vignettes, and to report their own emotional response. Although the emotion perception abilities of the autistic children were surprisingly good, their social and empathetic awareness was still less accurate than that of children in the comparison group (Yirmiya, Sigman, Kasari & Mundy, *in press*).

These observations raise questions as to where understanding of emotion may become too difficult for even very intelligent autistic children. When considered in relation to impairments in autism, studies of emotion in normal children delineate a developmental process that is useful in specifying sources of difficulty for autistic children.

The developmental literature suggests that children's affective experiences become more differentiated with age (Cicchetti & Hesse, 1982; Lewis & Michaelson, 1983; Sroufe, 1979). Although preschoolers are proficient at imputing simple emotions to themselves and others, emotion terms requiring cognitive advances and more complex understanding of social and interpersonal situations, such as pride and embarrassment, are not used until later (Thompson & Paris, 1981; Harter & Whitesell, 1989).

Philosophical (Isenberg, 1980) and psychological analyses (Harter & Whitesell, 1989; Harris, 1989) distinguish pride and embarrassment from happiness and sadness along several dimensions, including personal responsibility, normative standards, and the role of an audience. Pride is elicited in relation to outcomes for which one is responsible (Hume, cited in Taylor, 1980). For example, someone who prepares and eats a delicious meal has more reason to feel proud than one who eats in a restaurant (Seidner, Stipek & Feschbach, 1988). Control, too, is central, in that achievements that are the result of "purpose and effort" are greater cause for pride than, for example, inherited attributes (Isenberg, 1980, p. 358, cited in Seidner, 1988). Although an actual audience becomes less crucial as normative standards are internalized, the experience of pride also depends upon the evaluation of other people (Harter & Whitesell, 1989; Lewis, Sullivan, Stranger & Weiss, 1989; Stipek, 1983; Harris, 1989).

While perhaps less so than for pride, personal responsibility and control are also relevant to embarrassment. Falling down due to inattention (where personal responsibility and control are implied) may more strongly evoke embarrassment than

falling down after being shoved (where no responsibility is implied). But feelings of embarrassment may also arise in the latter case in response to having attracted public attention. Thus, while personal responsibility and an audience are considered relevant to both pride and embarrassment, personal responsibility seems more critical to experiencing pride, and an audience to experiencing embarrassment (Isenberg, 1980).

Seidner, Stipek & Feshbach's (1988) investigation of the age at which normal children associate "pride" and "embarrassment" with conditions based on the same criteria as adults lends empirical support to the theoretical distinctions outlined above. They asked school-aged children and adults to describe a time in which they had experienced pride, embarrassment, happiness and sadness. Responses were then coded on the following dimensions: locus, controllability, and the presence of audience. Ten- to 12-year-old children resembled adults in that the majority reported feeling proud in relation to internal and controllable events, and happy in relation to external and uncontrollable events, thus discriminating pride from happiness on the basis of locus and controllability. In keeping with the literature, older children's and adults' descriptions of pride less consistently referred to an audience than did those of younger children (6-8-year-olds).

Across ages, the majority of subjects reported internal and controllable embarrassing events, and consistently referred to the presence of an audience. Although not the case for adults, a significant proportion of 10- to 12-year-old children reported embarrassing events that were internal and *uncontrollable*. Sadness, however, was associated with predominantly external and uncontrollable events across age groups, such that sadness and embarrassment were reliably distinguished on the basis of locus and controllability.

In the first of two components, the present study applied Seidner, Stipek & Feshbach's procedure in comparing non-retarded autistic children, approximately 12 years of age, and normal controls (matched on gender, chronological age, mental and verbal ability). We were interested in the content and appropriateness of autistic children's reported emotional experiences, as well as the nature of the process of doing so.

Given the link between understanding complex emotions and metarepresentational ability, and theory of mind impairment in autism (Baron-Cohen, 1989; Leslie & Frith, 1988; Baron-Cohen, Leslie & Frith, 1985, 1986; Ozonoff, Rogers & Pennington, 1989), we hypothesized that autistic children would more frequently report experiencing pride and embarrassment in external-uncontrollable situations, and that they would be less able to discriminate these labels from happy and sad, respectively, than would normal children. We also predicted that autistic children's comparative lack of attention to others (Kasari, Sigman, Baumgartener & Stipek, in press) would be manifest in relation to embarrassment in that they would less consistently reference an audience.

In addition, we hypothesized that the process of talking about emotions would be more difficult for autistic than for comparison children, even when matched for verbal abilities, and that autistic children's difficulties would be reflected in greater response latency and increased frequency of prompting. Moreover, between-group differences were expected to be most significant in relation to the more complex emotions, pride and embarrassment. In light of the relatively high correlation between cognitive and

affective abilities identified with the empathy task for this sample (Yirmiya *et al.*, in press), we thought that their self reports might evidence signs of cognitive effort. Thus we predicted that autistic children would more frequently use phrases referring to cognitive processes, such as "I think", and that they would report general emotional experiences, which might reflect the application of a learned association or rule.

The second component of the study was designed to minimize verbal demands and to extend existing research on autistic children's ability to recognize and label affect in pictures. Previous studies have focused on primary emotions that have distinctive associated perceptual characteristics (e.g. smiling with happiness, crying with sadness) (Ekman & Freisen, 1975). Through the use of relatively ambiguous expressions, the measure used in this study afforded examination of group differences in response to representations of more complex, ecologically valid stimuli. We hypothesized that autistic children would more frequently offer inappropriate labels, and that the process would be significantly more taxing, as suggested by greater response latency and more frequent prompting.

### Methods

*Subjects.* The sample included 32 children, 18 high functioning children with autism and 14 normally developing controls. Research with this sample has been reported once previously (Yirmiya *et al.*, in press). All of the autistic children were diagnosed using DSM III (APA, 1981) criteria within 2 years prior to initiation of the study by clinicians not affiliated with the present project. Diagnostic criteria included onset of symptoms prior to age 30 months, pervasive lack of responsiveness to other people, gross deficits in language development and bizarre responses to various aspects of the environment (DSM III, APA, 1981). In order to be included in this study, the children were required to have current Verbal IQ, Performance IQ and Full Scale IQ scores of 75 or higher (as determined by the Wechsler Intelligence Scale—Revised), and to be free of additional diagnoses.

The control group included normally developing children who were matched with the autistic children on gender, Full Scale IQ score, and chronological age. In addition, paired *t*-tests revealed that the groups were not statistically different with regard to mental age, verbal ability, Verbal IQ, and Performance IQ. Control children also matched with the autistic children on cultural background and on SES as determined by the Hollingshead Index (1957). Sample characteristics are presented in Table 1.

In addition, parents of children in the autistic group completed the Vineland Adaptive Behavior Scales (Sparrow, Balla & Cicchetti, 1984), a measure of social functioning. Profiles indicated that with respect to the Communication Scale, 13 of the 18 (72%) autistic children were functioning at or above the standardized norm for their age, while the remaining 5 were below the norm. However, in terms of the Socialization Scale, 15 (83%) of the autistic children were significantly below the normal range. Although the scale was not administered to parents of children in the comparison group, there is no reason to suspect that they would differ from the standardized norms.

*Procedures.* The children and their parent/s participated in two 90-minute sessions, approximately 1 week apart. Children were interviewed individually by a graduate student in Psychology. In the first session, the WISC—R was administered to determine the appropriateness of the child as a subject. Having done so, a battery of standardized tests and experimental procedures were administered, two of which are the focus in the present study. Task order was counterbalanced over the two visits, and all sessions were both audio- and videotaped. While the child participated, the parent/s completed questionnaires.

#### *Understanding and experience of emotions*

The first procedure comprised a verbal measure of subjects' understanding and experience of happiness, sadness, pride and embarrassment. The examiner asked individual subjects to read the list aloud, and to tell about a time in which s/he felt each emotion. The order in which the different emotion situations

**Table 1. Sample characteristics: high-functioning autistic children and normally developing children matched on CA and IQ**

Characteristic		Autistic ( <i>n</i> = 18)	Normal ( <i>n</i> = 14)
Age <sup>a</sup>	M (S.D.)	149.94 (26.1)	143.5 (23.2)
Mental Age <sup>a</sup>	M (S.D.)	150.5 (27.6)	147.9 (18.2)
Verbal IQ <sup>b</sup>	M (S.D.)	98.6 (20.4)	105.0 (14.1)
Performance IQ <sup>b</sup>	M (S.D.)	105.3 (19.4)	103.1 (14.5)
Full Scale IQ <sup>b</sup>	M (S.D.)	101.9 (18.6)	104.4 (13.4)
Verbal Ability <sup>c</sup>	M (S.D.)	100.3 (20.0)	105.0 (14.1)
SES	M (S.D.)	3.5 (0.9)	3.8 <sup>d</sup> (1.1)
Males/females		17/1	13/1
Caucasian		10	8
Hispanic		4	2
Afro-American		2	2
Asian		2	2

*Note:* No significant differences between groups.

<sup>a</sup>In months.

<sup>b</sup>Based on the WISC-R.

<sup>c</sup>Based on sum or raw scores of WISC-R Verbal subtests.

<sup>d</sup>Based on 11 cases.

were elicited was randomized. When a child was unable to provide an example, the examiner related a time in which she felt the emotion (standard stories), and proceeded to finish the other emotions before returning to the source of difficulty. Prompting, in the form of additional questions (e.g. "What have you done that made you proud?") was used when a child did not respond, stated either that s/he had never felt the target emotion, or could not recall the corresponding situation.

*Coding.* After all of the subjects were interviewed, their reported experiences of emotions were coded using a modified version of the system developed by Seidner, Stipek & Feshbach (1988). The emotions data were coded by two raters, one of whom was blind to group status. Every response was coded according to the following dimensions: (1) locus—whether the event was internal to and controllable by the subject; (2) the presence or absence of an audience who observed the emotion-laden event. The specific categories for each of these dimensions appear in Appendix A.

Kappa coefficients of inter-rater agreement were calculated for each dimension by emotion: *locus*—0.81 (pride), 0.79 (happiness), 0.81 (embarrassment), 0.87 (sadness); *audience*—0.79 (pride), 0.80 (happiness), 0.85 (embarrassment), 0.80 (sadness). Disagreements were discussed until the raters reached consensus.

In addition, responses were rated on dimensions directed at assessing task difficulty, including response latency and prompt frequency. Using videotapes of the sessions, a rater timed response latency for each emotion (time lapse between the end of the questions and the beginning of the coded response). Using transcripts from the videotapes, both raters also tallied prompt frequency and response length in terms of number of words. Because 100% agreement was achieved across emotions for 10 subjects, the remaining 22 were coded by one rater.

In an effort to assess strategy, particularly cognitive, problem-solving effort, responses were coded as either general or specific. "General" responses include those referring to a broad type of experience ("I was happy when I did something good"), as opposed to a specific instance, or those reported in the present tense ("I'm angry when I get hit"). In contrast, the personal/specific category applied to responses wherein the subject identified a specific time and place, or included detail suggesting that s/he had a particular experience in mind ("I was happy last week at my birthday party when I got a new bike").

A reliability check was conducted after both raters coded data from 10 subjects. Agreement was achieved

at a kappa value of 0.73. The raters reached consensus on initial disagreements before coding the remaining responses. Overall inter-rater agreement was 0.79; consensus was reached on all disagreements.

A second measure focused on subjects' use of phrases referring to cognitive or problem solving effort. While not proof of thought, "thinking phrases" imply engagement in cognitive activity, and indicate tentativeness that might not be expected in response to open-ended subjective questions. Having excluded idiomatic use of "you know" and "I don't know" (which did not seem to reflect cognitive effort, nor to appear in the context of a codeable response), such phrases ultimately included "I think", "I guess" and "I can't remember". In coding "thinking phrases", raters achieved an overall kappa coefficient of 0.93.

#### *Ability to label affect in pictures*

In the second component of the study, the experimenter presented the child with eight photographs, one at a time, each of which depicted a child expressing an emotion. The examiner then asked the subject what the child in the picture is feeling, prompting as needed. Again, prompting took the form of directive questions (e.g. "Can you tell how the boy feels by what's going on and how he looks?"). Although the hedonic tone of the pictures was clear, labeling required some attention to context cues, and the expressions were ambiguous enough to afford an array of appropriate responses.

*Coding.* Transcripts were used to record emotion label frequencies for the eight photographs, establishing modal responses for each picture within groups. As a measure of task difficulty, response latency was determined, and, using transcripts from the sessions, two raters coded prompt frequency. The kappa coefficient obtained on this measure was 0.92. Consensus was reached on all disagreements.

## Results

### *Understanding of experienced emotions*

Very few children responded either that they did not know what made them feel an emotion or that they had never felt an emotion. These responses were counted as missing data and were excluded from analyses. Among the autistic subjects, one was unable to recount a time in which he felt proud, and another for embarrassment. Two of the comparison children were also unable to provide examples for embarrassment. In addition, one autistic subject refused to participate in the task, accounting for one case of missing data across emotions.

### *Pride and happiness*

In recounting their experiences of pride, autistic children's responses centered around themes including "finishing my homework" and "winning a game", that were also characteristic of the normal children's responses. Although their examples were generally appropriate, it is noteworthy that 4 of the 17 (23%) autistic children recounted the same experience for pride and happiness, while this was never the case among the comparison children. In addition, two subjects offered examples that were somewhat less apt: "proud of a dog", and "somebody gave me gold and silver".

In describing feeling happy, the autistic children most often referred to times in which they received a desirable gift, or were treated to an enjoyable experience, such as going to Disneyland. While generally similar to those of normal children, autistic children's examples were distinct in their reference to food, and their lack of reference to birthday parties.

*Locus and controllability:* Chi-square analyses of locus and controllability showed

no differences between the non-retarded children with autism and normally developing children in relation to pride, nor in relation to happiness. In discussing situations in which they felt proud, the majority of both autistic (71%) and normal (86%) children referred to internal, controllable events. An inverse pattern emerged in relation to happiness: 82% of the autistic children and 79% of the normal children reported external and uncontrollable happy experiences. Consistent with the normal developmental literature, both autistic and comparison children appeared to differentiate pride from happiness on the basis of locus and controllability.

**Audience:** Given the relatively low overall frequencies, for the purpose of chi-square analyses the three audience categories used by Seidner, Stipek and Feshbach (1988) were consolidated into two. The first included both explicit and implicit references to an audience, and the second to the lack thereof. Chi-square analyses did not yield a between-group difference in terms of subjects' references to an audience in describing pride-evoking events.

**Embarrassment and sadness.** In recounting their experiences of embarrassment, autistic children's responses centered around themes including "somebody being teased" and "feeling afraid and stupid". These stand in contrast to the lighter experiences recounted by comparison children, such as "when I threw the ball to the wrong team". The majority of children in both groups reported sad experiences involving loss, such as the death of a pet (normal, 42%, autistic, 23%) or relative (normal, 28%, autistic, 11%). In addition, several (33%) of the autistic children referred to being hurt or teased.

**Locus and controllability:** Chi-square analyses indicated that groups' responses did not differ on locus and controllability dimensions in relation to embarrassment and sadness. However examination of the basis for differentiating embarrassment from sadness revealed differences *within* groups. As expected, the majority of comparison children (86%) reported external-uncontrollable sad events. Conversely, the majority (83%) described internal embarrassing events, of which 60% were controllable and 40% were uncontrollable. Thus, consistent with the literature, children in the comparison group appeared to differentiate embarrassment from sadness on the basis of locus, but not controllability.

Like the comparison children, the majority (73%) of autistic children reported external, uncontrollable sad events. In contrast to the normal children, a substantial percentage (40%) of the autistic children also described *embarrassing* experiences that were external and uncontrollable. As was the case in the normal group, the autistic children reported some internal events that were controllable (27%), and others that were uncontrollable (33%). Most striking, then, was the finding that the autistic children did not appear to differentiate embarrassment from sadness on the basis of locus.

**Audience:** Chi-square analyses on the audience dimension yielded a significant between group difference in relation to embarrassment,  $\chi^2 (1, N = 27) = 4.21$ ,  $p < 0.02$ . As predicted, in describing feeling embarrassed, autistic subjects less explicitly and less frequently referred to the presence of other people than did normally developing children.

**Task difficulty.** With respect to response latency, *t*-tests yielded significant between-

group differences for the complex emotions, pride ( $t_{16} = 2.42$ ,  $p < 0.03$ ) and embarrassment ( $t_{21} = 3.10$ ,  $p < 0.01$ ), with autistic subjects requiring more time to offer a codeable response. (*t*-tests showed that autistic children also received a significantly greater number of prompts than comparison children when recounting situations engendering pride ( $t_{18} = 2.87$ ,  $p < 0.04$ ) and embarrassment ( $t_{22} = 2.5$ ,  $p < 0.01$ ). Additional (*t*-test showed that groups' responses did not differ in terms of mean number of words).

Table 2. Generality vs specificity: within-group percentages<sup>a</sup> and between-group differences

	Autistic		Normal		Group difference
	General	Specific	General	Specific	
Pride	81	19	21	79	$p < 0.002^*$
Happiness	59	41	29	71	n.s.
Embarrassment	67	33	8	92	$p < 0.002^*$
Sadness	25	75	7	93	n.s.

<sup>a</sup>Numbers refer to within-group percentages.

Within groups, Analyses of Variance (ANOVA) were conducted comparing reports of simple complex emotions. Results showed that autistic children took more time to recount their experiences of pride and embarrassment, than of sadness and happiness ( $F(1,24) = 4.61$ ,  $p < 0.005$ ). This was not the case for normal children, nor did ANOVAs reveal within-group differences in terms of prompt frequency.

*Cognitive strategy.* Chi-square analyses of response generality vs specificity also yielded significant between-group differences in relation to embarrassment,  $\chi^2(1, N = 28) = 7.83$ ,  $p < 0.002$ ; and pride  $\chi^2(1, N = 30) = 8.47$ ,  $p < 0.002$ .

Given the infrequent occurrence of "thinking phrases", groups were compared based on a sum across the four emotions. Results were marginally significant, suggesting that autistic children used thinking phrases more often than normal children ( $t_{28} = 1.85$ ,  $p = 0.07$ ).

#### *Understanding of affect in pictures*

In the absence of a designated "correct response", between-group comparisons served as the basis for evaluating autistic subjects' performance on this task. A frequency distribution showed that autistic and normally developing subjects were remarkably similar in terms of the labels they associated with eight pictures depicting emotional expressions. The modal emotion-label was identical for both groups with respect to all but one picture, in which case both modal responses were fitting. Occasionally, however, autistic children offered a label that was somewhat odd or inappropriate. For example, given a picture of a boy shaking his fist, in real or feigned anger, subjects in both groups said he was "angry" or "happy", yet some autistic subjects offered less apt responses: "shy", "scornful" and "itchy".

Table 3. Task difficulty

	Autistic <sup>a</sup>		Normal <sup>b</sup>	
	M (S.D.)		M (S.D.)	
Happiness				
Prompt frequency	0.47	(0.71)	0.21	(0.42)
Response latency <sup>c</sup>	0.88	(0.47)	0.59	(0.38)
Pride				
Prompt frequency	1.35	(1.69)*	0.14	(0.36)
Response latency	1.14	(0.46)*	0.59	(0.46)
Sadness				
Prompt frequency	1.69	(2.33)	0.36	(1.34)
Response latency	1.10	(0.46)	0.75	(0.60)
Embarrassment				
Prompt frequency	1.43	(1.36)*	0.50	(0.65)
Response latency	1.40	(0.41)*	0.75	(0.56)

\*Between-group difference,  $p < 0.05$ .

<sup>a</sup> $N = 14$ : happiness, pride, sadness;  $N = 12$ : embarrassment.

<sup>b</sup> $N = 17$ : happiness, sadness;  $N = 16$ : pride, embarrassment.

<sup>c</sup>In log seconds.

With respect to analyses of task difficulty,  $t$ -tests of means summing across emotions demonstrated that response latency ( $t_{23} = 2.80$ ,  $p < 0.01$ ), and prompt frequency ( $t_{19} = 3.11$ ,  $p < 0.006$ ) were significantly greater among autistic children.

### Discussion and Conclusions

Overall, autistic children performed surprisingly well. Their performance on the affect labeling procedure revealed an ability to connect a wide array of affect expressions with relatively complex feeling states. They also showed considerable ability to talk about and differentiate their emotion-laden experiences. Autistic children appeared to have some difficulty, however, in relation to complex emotions, pride and embarrassment. Focusing on pride and embarrassment, the following discussion will integrate results as they relate to understanding of emotion, as well as theories about the nature of impairment and compensation in autism.

*Embarrassment.* Autistic children manifest most difficulty in describing their experiences of embarrassment. Almost half of the autistic children recounted embarrassing events that were external and uncontrollable, the conditions also associated with sadness, and they less frequently referred to an audience. It may be that they possess a limited understanding of the term "embarrassment". Yet the salience of other people in embarrassing situations involves imagining the derogatory thoughts that they are thinking about oneself. To the extent that autistic children's lack of reference to an audience or generally limited understanding of embarrassment is rooted in the inability to monitor the attitudes and opinions of others, these findings are consistent with theory of mind models of impairment in autism.

Results from the affect labeling procedure lend additional support to this interpretation. In response to a picture of a boy exiting the girls' bathroom, the modal response for both normal (86%) and autistic (39%) subjects was "embarrassed". Yet almost as many autistic children (37%) offered "confused", which, while appropriate, manifests a lack of regard for social evaluation.

Autistic children's lack of reference to an audience in recounting embarrassment might also be associated with evidence that young autistic children show deficits in behaviors involved in joint attention and affective sharing (Mundy, Sigman, Ungerer & Sherman, 1986; Sigman, Mundy, Sherman & Ungerer, 1986; Volkmar & Mayes, 1990; Kasari *et al.*, 1990, in press). Thus it appears that autistic children experience emotions and develop emotion concepts under different conditions than do normal children specifically with respect to the salience of other people.

Furthermore, consistent with their reports, autistic children may indeed feel embarrassed in a broader array of situations than do normal children. Such situations might include being forced to take part in an activity in which one feels incompetent, or to participate in a social situation that is indecipherable. It may be that their failure both to differentiate sadness from embarrassment on locus and controllability and to refer to an audience in relation to embarrassment stems from a paucity of internal controllable social experiences. It is possible, too, that the sense of a critical audience pervades autistic persons' experiences such that they are compelled to avoid, rather than solicit, the appraisal of others.

*Pride.* The majority of both autistic and normal children recounted internal-controllable experiences of pride. Both groups were divided in terms of references to an audience. Consistent with previous findings in normal children, these results may suggest that autistic children possess highly differentiated concepts of pride. This interpretation is challenged, however, by the finding that nearly one quarter of the autistic children offered precisely the same example for pride as for happiness.

Furthermore, the absence of references to an audience in older normal children's descriptions of pride is assumed to reflect internalized social reactions and attitudes. Given their relative unresponsiveness to praise (Kasari, Sigman, Baumgartener & Stipek, in press), coupled with a lack of access to other's attitudes, the normal developmental trend does not appear to apply to autistic children. While they may experience pleasure in mastery (Kasari, *et al.*, in press), the deficits identified in autistic children are likely to interfere with their experience and understanding of socially mediated pride.

### *Task difficulty*

The findings that autistic children took longer and received more prompts in describing experiences of pride and embarrassment suggests that they have more difficulty with these complex emotions than do normal controls.

The finding that the autistic children used phrases such as "I think" more frequently than control children might suggest that talking about emotions required more cognitive effort for autistic children, and that they possess a relatively tentative grasp of their own emotional experiences. While it is possible that these phrases constitute "filler",

as the children searched their lexicon, mental state verbs seem an unlikely choice given that they rarely occur in the speech of autistic children (Tager-Flusberg, in press).

The general nature of autistic children's responses might suggest that they generated responses on the basis of rules or learned associations, rather than their subjective experiences. While an autistic child reported feeling proud when, "Well . . . I think . . . when I did something really good", a normally developing child said, "I was proud on Saturday at my baseball game when I caught a really high good pop-up".

A further interpretation might be that autistic children attempted to use their cognitive abilities to compensate for a limited ability to understand or translate emotion-laden events. Initially formulated by Hermelin and O'Connor (1985) the hypothesis that autistic individuals with advanced cognitive capabilities learn ways to recognize and express emotions that "come naturally" to non-autistic children has received some empirical support (for review see Yirmiya & Sigman, 1991). In the present study it is possible that cognitive strategies, such as the use of prototypical happy and sad events, facilitated discussion of simple emotions, but were insufficient in relation to complex emotions despite considerable time, thought and assistance. Finally, the relative contribution of cognitive capacities might contribute to differences between autistic and normal children in terms of their experience, as well as their understanding, of emotion.

In addition, it is unlikely that these findings are largely attributable to deficits in autistic children's language ability. Groups were carefully matched on verbal ability, and the verbal demands of the task were not great. Moreover, while the pragmatic abilities of autistic children may have been less than those of normal children, pragmatics and social understanding are inextricably intertwined. Additionally, discussion of the specificity of task difficulty measures to emotion perception tasks would have benefitted from inclusion of a narrative task that did not focus on emotions. It is conceivable, though, that access to the attitudes of a real or internalized audience might be a foundation for narrative ability in general.

*Implications for social interactions.* It is important to consider how autistic children's difficulties in this study might bring to bear in social interactions. First, however infrequent, it is likely that errors such as attributing "itchiness" to a social partner who is conveying feelings of joy, would forcefully and memorably disrupt a social exchange. Also, because each aspect of emotion comprehension and expression seemed to be relatively time consuming and effortful for autistic children, they are likely to experience even greater difficulty in the context of social exchanges where an array of cues must be interpreted and synthesized simultaneously.

In their focus on content and process the components of this study contribute to a "thick description" (Geertz, 1973) of understanding of emotion in autism. The measures provide a window into the nature of autistic individuals' experiences of emotion, and their efforts to understand and articulate these experiences. Studies that identify the ways in which high-functioning autistic children compensate for existing impairments may prove useful in ascertaining what can be taught to facilitate the expression and sharing of feeling states. Just as verbal language affects thinking, mastering the verbal and non-verbal vocabulary of communication about emotions may affect the ability to feel and share feeling with others. Continued research in

this area would not only advance the formulation of a more adequate theory of autism, but may widen the scope for successful intervention with autistic children.

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**Appendix A**  
**Coding Categories**

Dimension	Definition	Examples
<b>Locus</b>		
Internal-controllable	Statements related to and centered on the child, child's efforts, and over which the child could exert some control	"I ran fastest" "I was bad in school"
Internal-uncontrollable	Statements related to and centered on the child but not in the child's control	"I'm too tall"
External-uncontrollable	Statements not directly centered on, or controllable by child	"My uncle got married"
Audience explicit	Specific reference to or others who had observed the emotion-inducing event	"I fell and the other kids saw" "I won and people clapped"
Implied	No observer mentioned, but the event described generally implies the presence of an audience	"I scored the winning goal"
No audience	No specific reference to an observer, no contextual implications of an audience	"I was running and I tripped"

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