Emotional Understanding in Aggressive and Nonaggressive Individuals With Mild or Moderate Mental Retardation

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Abstract
Deficits in emotion recognition have been linked with aggression. However, the ecological validity of previous studies is limited. In this study we developed new materials to investigate the emotion identification skills of 19 frequently aggressive and 15 nonaggressive adults with mental retardation. The three tasks included photographs of faces, individuals displaying emotional expressions in context, and cartoon characters in interaction. Control tasks dealt with the intellectual demands of each condition. Emotion identification improved with increasing contextual cues across both groups. Aggressive participants had greater difficulty labeling emotions in contextually rich photographs than their nonaggressive peers and were more likely to mislabel the target character’s emotion as angry in the cartoon task. Findings have implications for models of aggression and clinical interventions.
Emotion recognition

In other words, the aggressive participants were more likely to label faces as angry or sad when they were not. However, methodological weaknesses, such as a reliance on simple emotional stimuli and verbal labeling tasks, and a failure to control for the intellectual demands of the tasks prevents clear conclusions being drawn regarding emotion recognition.

Loveland et al. (1997) reported that individuals determine emotion in others by utilizing cues other than facial expression, such as body posture, language, and tone of voice. Despite this finding, investigators who focus on emotional understanding in people with mental retardation have mainly used decontextualized person-related stimuli, which are simplified in form. For example, the Ekman and Friesen (1976) photographs of facial affect have been widely used (Leung & Singh, 1998; Walz & Benson, 1996). Moore, Hobson, and Angerson (1995) and Moore, Hobson, and Lee (1997) have argued that such photographs led to an underestimation of individuals’ abilities because they lack the dynamic and contextual cues present in day-to-day interaction.

A further problem with researchers investigating emotion recognition is that they have a tendency to rely on verbal labeling of emotion (Moore et al., 1997), despite the findings that individuals with mental retardation often have difficulties with receptive and expressive communication (McLean, Brady, & McLean, 1996). In fact, the ability to identify emotion has been found to relate to the cognitive demands of the task being used (McKenzie et al., 2001). Few investigators have controlled for the cognitive demands of emotion identification tasks, underestimating the contention that people with mental retardation have emotion-specific deficits (Rojahn et al., 1995).

In the present study we attempted to address these methodological problems in investigating emotion identification in individuals with mental retardation. We hypothesized that the accuracy of emotion identification would be higher on the tasks using contextually rich stimuli. We also examined the accuracy and errors of emotion identification in individuals who are aggressive relative to their nonaggressive peers. We specifically hypothesized that (a) those who are aggressive will not be impaired in their ability to label emotion as compared with nonaggressive peers and that (b) consistent with the finding by Walz and Benson (1996), aggressive individuals would demonstrate a negative bias when mislabeling emotions using photographs of (decontextualized) faces. We also examined this same bias by using (a) more naturalistic, contextually rich photographs; and (b) a nonverbal task, with a forced-choice methodology. We believed that the nonverbal task would help to clarify whether the negative bias is merely a labeling difficulty linked with expressive communication problems or to a specific cognitive bias in the interpretation of emotional cues.

Method

Participants

Participants were 19 people who were frequently aggressive and 15 individuals with no significant problems with aggression (N = 34). They were recruited from five adult resource centers in the central belt of Scotland that provided specialist day activities for individuals with mental retardation. Adult resource center staff identified potential participants from among service users with whom they had worked for at least 3 months. Participants were eligible for inclusion if (a) they had mild to moderate mental retardation and (b) adequate verbal communication to perform tasks (i.e., the ability to give their own name and simple information about themselves and pass on that information to others). Those with a diagnosis of autism or a major psychiatric disorder, including schizophrenia and dementia, were excluded because emotion recognition has been identified as impaired in these groups (Heimberg, Gur, Erwin, Shtasel, & Gur, 1992; Hobson, 1986; Kuczuk & Feldmar, 1979).

Resource center staff completed an adaptation of Harris, Humphrey, and Thompson’s (1994) Checklist of Challenging Behavior for those who met the inclusion criteria. The frequency of aggressive behavior was used to select participants (Pert et al., 1999) who had (a) four or more aggressive incidents involving significant physical or verbal aggression identified as aggressive and (b) who had no reported behavior of this nature identified as nonaggressive. The objective was to recruit the 8 most frequently aggressive men and women and 8 nonaggressive men and women. However, due to limited numbers available, all those who fulfilled the above criteria were asked to participate. Information was acquired for 11 men and 8 women who were frequently aggressive as well as 7 men and 8 women who had no re-
ported aggressive behavior. One woman consented but was unable to participate due to illness.

For the aggressive group, the frequency of aggressive behavior had ranged from 5 incidents to 181 incidents over the preceding 3 months. There were three categories of aggression: (a) physical aggression towards others, (b) verbal aggression towards others or deliberate aggression towards others’ property, and (c) aggressive behavior not specifically directed towards others. Of the 19 aggressive individuals, 5 had been physically aggressive towards others; 16, verbally aggressive towards others or property; and 16 had also demonstrated aggression that was not directed at specific people. Therefore, 16 of these participants had been involved in incidents of significant interpersonal aggressiveness.

Participants’ level of verbal comprehension and nonverbal reasoning ability was assessed using the British Picture Vocabulary Scale 2nd Edition—BPVS-II (Dunn, Dunn, & Whetton, 1982) and Raven’s Matrices (1965). Participants’ characteristics are presented in Table 1. The BPVS-II scores for the aggressive group corresponded with age equivalents of 3 years, 0 months (3;0) to 11;4, with the age equivalents for the nonaggressive group ranging from 2;9 to 13;0. As can be seen, 3 individuals with possible borderline intellectual functioning, as derived from the Raven’s Matrices, were included within the sample. All individuals lived in a community setting.

We employed a Mann Whitney U test (2-tailed) to examine group (aggressive, nonaggressive) differences on BPVS-II raw scores, IQ bands derived from Raven’s Matrices, and chronological age (CA). There were no significant differences between the two groups on any measure.

**Materials and Design**

The study consisted of three tests of emotion identification and three no emotion measures to control for the cognitive demands of the task. All measures were designed for this study, with the exception of the emotion task using decontextualized photographs (Ekman & Friesen, 1976). To develop new measures, we conducted extensive piloting with nondisabled individuals to ensure the faces and situations chosen reflected the specific emotion or activity category required. A particular difficulty encountered during piloting was to establish social situations that the nondisabled individuals agreed had the same emotional meaning. The final materials were given to 18 nondisabled judges. Agreement is given for each measure as described.

**Decontextualized Photographs**

**Emotion labeling.** Photographs taken from The Pictures of Facial Affect, developed and validated by Ekman and Friesen (1976), were used to assess individuals’ ability to accurately label emotions. This measure consists of 12 (6 male, 6 female) monochrome photographs (12 cm × 18 cm) of faces expressing the basic emotions of happiness, sadness, fear, anger, surprise, and disgust (Izard, 1971). These photographs were demonstrated to have an interrater agreement of 91% to 100% across the emotions for adults with no disabilities (Ekman & Friesen, 1976).

**No emotion labeling.** This control task consisted of 12 (6 male, 6 female) monochrome photographs (12 cm × 18 cm) of individuals engaged in six basic activities (reading, writing, drinking, telephone use, brushing teeth, brushing hair) with minimal contextual and affective information. There was 100% agreement among the judges about the nature of activities being shown.

**Photographs With Context**

**Emotion labeling.** This measure was used to determine the effects of contextual information on emotion labeling. It consists of a set of 6 color photographs of males and 6 color photographs of females (12 cm × 18 cm and 14 cm × 20 cm) of individuals expressing the basic emotions described above, within a context. Contexts includ-
ed happiness at a wedding, sadness at a funeral, anger at a demonstration, fear at seeing a spider, surprise on reading a letter, and disgust when eating a meal. This measure was influenced by the work of McKenzie, Matheson, McCaskie, Hamilton, and Murray (2001), and we utilized ColorCards (Harrison, 1996a, 1997) and photographs. The latter were produced using posed expressions of adults. The models, who were not actors, were shown the Ekman and Friesen (1976) faces. Photographs were then taken of the models showing these facial expressions in contextually congruent situations. Agreement between the judges for facial expressions ranged from 94.4% to 100%.

No emotion labeling. This control task consisted of a male and female set of 6 colored photographs (12 cm × 18 cm and 14 cm × 20 cm) of individuals engaged in basic activities (drinking, eating, telephone use, reading, swimming, and sleeping) with contextual cues available. The materials employed were ColorCards (Harrison, 1991a, 1991b, 1991c, 1994, 1995, 1996b, 1997, 1998) and photographs. Agreement for the activities represented was 100% between the judges.

**Cartoons With Context**

The cartoon drawings were created by a professional cartoonist.

**Emotion task.** This task was developed as a nonverbal measure of emotion identification using contextually rich stimuli. It consisted of 12 cartoons of two individuals interacting within scenes and displaying the basic emotions (e.g., a happy person receiving a present; a sad person standing by a graveside; an angry man in a fight; a surprised person at a surprise party; an individual exhibiting disgust at seeing a ghost, and someone exhibiting disgust at seeing a dog defecating on the pavement). Agreement among the judges for the emotions depicted by the cartoons ranged from 83.3% to 100%. The central character in each picture (a male and female per emotion) had an outline where his or her head should be. A set of male and female costumes, linked with the cartoon activities, were drawn onto pieces of card that fitted the outline of the central character’s body. In the same fashion as the emotional heads, the costumes could be picked up and placed on the character.

**Procedure**

Interviews were conducted in a quiet room at the adult resource centers. The assessment measures were administered over two sessions, with the psychometric measures conducted during the initial session. The sequence of the emotion and control tasks were randomly altered to control for order effects as were the items within each task.

**Decontextualized photographs and photographs with context.** The two tasks were introduced to the participant as follows: “You are going to see some pictures of people. I want you to look at the picture and tell me how the person is feeling/what they are doing.” The participant was shown each photograph and asked, “Tell me what you see.” If necessary, they were asked, “Tell me how the lady/man is feeling” for the emotion tasks, or “Tell me what the lady/man is doing” for the no emotion tasks.

Responses for emotion labeling tasks were recorded verbatim. They were compared to lists of acceptable words developed by previous researchers (Harrigan, 1984; Izard, 1971, p. 270; Walz, 1995, p. 46). If a response corresponded with a word on the list, the response was categorized accordingly. If the response was not listed, two independent judges were asked to categorize the response into one of the six basic emotions or an other category (Walz, 1995). Very few specific emotion words were elicited that could not be classified into the six basic emotions. For the no emotion labeling tasks, the raters judged all responses as to whether the activity was represented in the response. Interrater agreement between the independent raters was 90.2% for emotion responses and 93.3% for activity responses.

**Cartoons with context.** For the cartoon tasks, participants were told: “I am going to show you some drawings of people.” They were given a cartoon with one of the protagonist’s head or cloth-
ing missing and asked, “What do you think is happening here?” to focus their attention. They were then provided with a set of male or female heads (emotion task) or clothes (no emotion task) as appropriate and asked, “Which do you think is the correct head/body?” They were encouraged to place their choice on the picture, and asked, “Is that the right head/body?” If they were unsure they were encouraged to try once more.

Data Analysis
The data were significantly skewed, violating a key assumption of parametric statistics. Consequently, we used nonparametric statistics. Although the large number of statistical tests across the different conditions increases the possibility of a type I error occurring, a number of factors mitigate against this. First, nonparametric statistics are more conservative than their parametric counterparts. Second, despite the direction of the hypotheses being stated clearly in advance, we used 2-tailed statistical tests. Therefore, we decided not to change the alpha values because such a correction could heighten the possibility of a type II error (Perneger, 1998), particularly because novel stimuli were being investigated. With regard to missing data, one participant’s ability to identify sadness on the cartoon task was not assessed.

In the Results section we examine (a) whether the cognitive demands of the task influenced the findings; (b) the pattern of emotion recognition across the three conditions; (c) a comparison of accurate emotion responses on the three tasks; (d) differences in correct responding between the aggressive and nonaggressive group; (e) the pattern of errors made by the aggressive and nonaggressive participants; (f) performance on the vocabulary measure in relation to emotion identification; and (g) correct responding in relation to IQ, age, and gender.

Results
Comparing Responses on Emotion Task Versus Cognitive Control Task
Correct responses to items were awarded a point, with total scores ranging from 0 to 12 per task. Table 2 shows the median number of correct responses for the emotion task and the cognitive control task obtained by each group. We employed the Wilcoxon matched-pairs signed-ranks test (2-tailed) to examine differences in responding between the emotion and no emotion tasks for both the aggressive and nonaggressive groups. Aggressive individuals demonstrated significantly higher scores on the control tasks than emotion tasks when assessed using decontextualized photographs, photographs with context, and cartoons.

Table 2. Median Number of Correct Responses by Group and Task

<table>
<thead>
<tr>
<th>Condition/Group</th>
<th>Emotion tasks</th>
<th>No emotion tasks</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>Interquartile</td>
<td>Median</td>
<td>Interquartile</td>
</tr>
<tr>
<td>Decontextualized</td>
<td></td>
<td>range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>photographs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agg.*</td>
<td>4.00</td>
<td>1.00</td>
<td>12.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Nonagg.*</td>
<td>5.00</td>
<td>3.00</td>
<td>12.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Photographs with context</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agg.</td>
<td>5.00*</td>
<td>2.00</td>
<td>12.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Nonagg.</td>
<td>8.00*</td>
<td>3.00</td>
<td>12.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Cartoons with context</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agg.</td>
<td>4.00</td>
<td>4.00</td>
<td>9.00</td>
<td>7.00</td>
</tr>
<tr>
<td>Nonagg.*</td>
<td>5.50</td>
<td>5.00</td>
<td>11.00</td>
<td>3.00</td>
</tr>
</tbody>
</table>

*Aggressive (n = 38 responses). †Nonaggressive (n = 30). ‡Nonaggressive (n = 28 responses) due to missing data.
*Mann Whitney U test comparing aggressive and nonaggressive groups, p < .05.
with context, \( z = -3.86, p < .01, z = -3.83, p < .01, z = -3.56, p < .01, z = -3.43, p < .01, z = -3.21, p < .01 \), respectively. The high rate of responding on the control task suggests that the cognitive demands of the task did not prove a barrier to emotion identification for either group.

**Accurate Identification of the Emotional Expressions**

Tables 3, 4, and 5 illustrate that happiness was the most accurately identified emotion in each condition for both the aggressive and nonaggressive groups. It is noteworthy that both groups had greatest difficulty identifying happiness in the cartoon condition. Sadness and then anger were the next most frequently identified emotions. However, the aggressive group identified sadness as commonly as anger on the decontextualized photograph condition, with the nonaggressive group identifying these emotions equally during the cartoon condition. The number of times the other emotions, namely, surprise, fear, and disgust, were correctly identified varied across conditions and between groups. The “other” category included mainly descriptions of the images, (e.g., staring, frowning), more generic or ambiguous terms (e.g., not sad, ok), as well as “don’t know” responses. There was no evidence of a different pattern of “other” responses produced by the aggressive and nonaggressive groups.

**Correct Responding on Emotion Tasks Across Three Conditions**

Using Friedman’s rank test, we found that both groups demonstrated significantly different responding on emotion tasks across the three conditions: photographs with and without context and cartoons with context, \( \chi^2(2) = 9.08, p < .05 \) for the aggressive group, and \( \chi^2(52) = 11.81, p < .01 \) for the nonaggressive group. This was followed by pair-wise Wilcoxon signed ranks tests (2-tailed), which demonstrated that both the aggressive and nonaggressive groups were significantly more accurate when assessed with photographs with context than with decontextualized photographs, \( z = -3.22 \) and \(-3.19\); respectively, \( ps < .01 \).

**Comparison Between Aggressive and Nonaggressive Groups: Correct Responding**

The Mann Whitney \( U \) (2-tailed) test was employed to examine the differences in correct responding between the aggressive and nonaggressive groups on each task. As can be seen from Table 2, the only significant group difference that emerged was on the emotion task during the photographs with context condition, \( U = 71.00, p < .05 \). The nonaggressive group demonstrated a significantly higher rate of correct responding than did the aggressive group on this task.

**Comparison Between Aggressive and Nonaggressive Groups: Examination of Errors Made in Identification of Emotions**

In addition to showing correct responses, Tables 3, 4, and 5 also categorize incorrect responses for each facial expression presented, over the three conditions. We performed Mann Whitney \( U \) tests to examine the differences between the aggressive and nonaggressive groups for each emotion iden-

<table>
<thead>
<tr>
<th>Facial expression</th>
<th>Happy</th>
<th>Sad</th>
<th>Angry</th>
<th>Fear</th>
<th>Surprise</th>
<th>Disgust</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response</td>
<td>A(^a)</td>
<td>NA(^b)</td>
<td>A</td>
<td>NA</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>Happy</td>
<td>33</td>
<td>28</td>
<td>7</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Sad</td>
<td>0</td>
<td>0</td>
<td>16</td>
<td>18</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Angry</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>4</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>Fear</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Surprise</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Disgust</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>2</td>
<td>8</td>
<td>3</td>
<td>8</td>
<td>5</td>
</tr>
</tbody>
</table>

\( ^a \)Aggressive \( (n = 38 \) responses). \(^b\)Nonaggressive \( (n = 30 \) responses).
**Table 4.** Emotional Labels Given by Groups to Emotional Photographs With Context

<table>
<thead>
<tr>
<th>Facial expression</th>
<th>Happy</th>
<th>Sad</th>
<th>Angry</th>
<th>Fear</th>
<th>Surprise</th>
<th>Disgust</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response</td>
<td>A&lt;sup&gt;a&lt;/sup&gt;</td>
<td>NA&lt;sup&gt;b&lt;/sup&gt;</td>
<td>A</td>
<td>NA</td>
<td>A</td>
<td>NA</td>
</tr>
<tr>
<td>Happy</td>
<td>34</td>
<td>28</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Sad</td>
<td>0</td>
<td>0</td>
<td>26</td>
<td>27</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Angry</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Fear</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Surprise</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Disgust</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>2</td>
<td>9</td>
<td>1</td>
<td>10</td>
<td>4</td>
</tr>
</tbody>
</table>

*Note.* Each expression was presented twice, one for each gender.<br>  aAggressive (*n* = 38 responses). bNonaggressive (*n* = 30 responses).

tified incorrectly. For these analyses, the number of times an individual chose a particular emotion incorrectly was tabulated. No significant differences in error rates were found between the groups on incorrectly labeled emotions for the decontextualized and contextualized photographs. However, for the cartoon task the aggressive group was significantly more likely to incorrectly identify an emotion as anger than was the nonaggressive group, 2-tailed, *U* = 80.5, *p* < .05. As can be seen from Table 5, the disgusted and frightened facial expressions were most often confused with anger.

**Performance on the Vocabulary Measure in Relation to Ability to Identify Emotions**

We examined scatterplots and the results suggested an association between BPVS-II raw scores and number of correctly scored items on all emotion tasks and on the no emotion task during the cartoon condition. Spearman's correlation coefficient (2-tailed) confirmed that BPVS-II scores were significantly positively correlated with performance on the emotion tasks: for decontextualized photographs, *r* = .36, *p* < .05; photographs with context, *r* = .61, *p* < .01; and cartoons, *r* = .56, *p* < .01, respectively. Further, performance on the cartoon no emotion task was significantly correlated with BPVS-II scores, *r* = .58, *p* < .01. Given the limited variability in control task performance on the other conditions, we did not analyze these data sets.

**Performance on Emotion Tasks in Relation to IQ, Age, and Gender**

Scatterplots were also examined for associations between correct responding on emotion tasks for the sample as a whole and age or IQ bands as derived from Raven’s Matrices (1965). Using a Spearman correlation coefficient (2-tailed), we confirmed a significant negative association between age and accuracy for each condition (decontextualized photographs, *r* = −.41, *p* < .05; photographs with context, *r* = −.73, *p* < .01; cartoons, *r* = −.73; *p* < .01. However, no association was found between accuracy scores and IQ bands for any condition. Further, using a Mann Whitney *U* test (2-tailed), we were unable to identify any significant difference between men and woman’s ability to correctly identify emotions on the tasks.

**Discussion**

Findings from the control tasks indicate that the intellectual demands of the emotion recognition assessments were not a barrier to success. Moreover, in keeping with previous evidence, happiness was found to be the easiest emotion to identify, followed by sadness and then anger (Walz & Benson, 1996). Developmentally, happiness and then sadness are the first emotions to be recognized (Izard, 1971). Consistent with Walz and Benson (1996), the ability of aggressive and nonaggressive individuals to label emotions was found to be comparable when assessed with Ekman and Friesen’s (1976) decontextualized faces. However, when aggressive participants were assessed with contextually rich emotional photographs, they were found to be impaired relative to nonaggressive peers. Contrary to previous evidence (Walz & Benson, 1996), there was no difference in the two groups’ pattern of errors on the
Table 5. Emotional Faces Picked by Group for Target Cartoon Characters in Emotive Situations

<table>
<thead>
<tr>
<th>Emotional context</th>
<th>Response</th>
<th>Happy</th>
<th>Sad</th>
<th>Angry</th>
<th>Fear</th>
<th>Surprise</th>
<th>Disgust</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>NA</td>
<td>A</td>
<td>NA</td>
<td>A</td>
<td>NA</td>
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<tr>
<td>Happy</td>
<td>22</td>
<td>23</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Sad</td>
<td>2</td>
<td>1</td>
<td>19</td>
<td>19</td>
<td>5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Angry</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>14</td>
<td>19</td>
<td>9</td>
</tr>
<tr>
<td>Fear</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>7</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Surprise</td>
<td>5</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Disgust</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>5</td>
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<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Note.* Each expression was presented twice, one for each gender.


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decontextualized facial expressions and the contextual photographs. Yet, the aggressive group proved more likely than the nonaggressive group to choose the angry face when they made errors on the cartoon task.

The current research complements previous findings showing an increase in accuracy of emotional recognition with the introduction of contextual and dynamic cues (Harwood, Hall, & Shinkfield, 1999; McKenzie et al., 2001). Thus, previous researchers who used static, decontextualized measures may have underestimated the ability of individuals to accurately identify emotions. Our results support Moore et al.’s (1995) argument that methods relying on simplified stimuli, without dynamic or temporal cues, may in fact prove a hindrance because they require “the deployment of more inferential, cognitively based capacities” (Moore et al., 1995, p. 84). Instead, Moore et al. argued that aspects of person perception are more direct, independent of level of intellectual functioning.

The poor performance of the aggressive group on the contextual photograph task as compared with their nonaggressive peers appears to demonstrate a specific deficit in emotional understanding. This is because there was no difference between the two groups on the control task (Rojahn et al., 1995). One explanation might be that aggressive individuals attend to fewer cues in the environment and, thus, benefit less from increasing amounts of contextual information. Indeed, Dodge (1993) demonstrated that aggressive boys attended to fewer social cues than did nonaggressive children when interpreting ambiguous interactions, leading to a less accurate appraisal of social situations.

In addition to possible differences in the processing of emotional cues, evidence suggests that aggressive participants attached different emotional meaning to certain social situations than did participants in the nonaggressive group. In particular, they were more likely to choose the angry face when they made errors on the cartoon task. This finding is consistent with the hostile attributional bias identified in aggressive children (Dodge, 1993). Such a bias has also been reported in case studies with aggressive individuals (Black, Cullen, & Novaco, 1997). However, the current findings on a nonverbal task are of particular importance because they reinforce the view that such a bias is a cognitive distortion in the interpretation of emotional cues and not merely a labeling bias.

The research surrounding the link between intellectual ability and emotion identification is conflicting. The current findings are consistent with the notion that the ability to identify facial expressions of emotion is independent of intelligence (Leung & Singh, 1998). Further, there was no effect of gender on ability to accurately identify emotional expressions, consistent with previous findings (Eckert, 1999; Maurer & Newbrough, 1987). However, an association between emotion identification and age was found, with older individuals being more impaired than younger individuals. These results are consistent with the findings of Wilcenski (1989) but require further investigation to examine whether this reflects a differential pattern of aging (McKenzie et al., 2001). In addition, a positive association was
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found between performance on the emotion tasks and receptive vocabulary, which is consistent with previous research (Walz & Benson, 1996).

The results of the present study should be viewed with caution due to a number of limitations in sample characteristics. Due to a small sample size, our results may be underpowered. Three individuals with borderline intellectual functioning, as estimated using the Ravens’ Matrices (1965), were also included in the study. However, they had all received services for individuals with mental retardation since childhood. There was also a failure to control for the etiology of participants’ mental retardation or their sensory difficulties. Finally, we recruited aggressive individuals on the basis of interpersonal conflict and aggression that was not personally directed. We designed the research to investigate emotional recognition and aggression and were, therefore, essentially concerned with socioemotional factors. Although the large majority of participants in this study had been involved in significant incidents of interpersonal aggression, it would have been preferable to have ensured greater homogeneity of the sample in terms of their interpersonal aggressiveness.

With regard to the newly developed measures, we did not examine test–retest reliability and did not control for the use of colored stimuli in the contextual photographs. Further, a ceiling effect was found for the no emotion tasks, as was the case in previous studies in which researchers used control tasks (Walz, 1995). The BPVS may not have been the most appropriate measure of verbal ability because certain items contain an emotional element (Hobson & Lee, 1989). Hence, the correlation between receptive verbal ability as measured by the BPVS and emotion recognition may not be surprising.

Further work is required on the cartoon task. When developing the cartoon measure, we found that it was difficult to identify particular situations that would evoke a single, discriminable emotion. Reasonable levels of agreement were obtained in the piloting phase from nondisabled judges about the particular emotions being represented. Yet, contextual ambiguities may still have made it difficult for participants to identify the target emotion. For example, they correctly identified happiness less often with the cartoons than with the other two tasks. The scenes depicting someone receiving a present could elicit happiness or surprise, depending on whether one expected to receive it or not. One suggestion for future use of this method would be to allow the participants to produce more than one response when there is ambiguity about the emotion being represented. Analyzing the range and order of the emotions suggested by the participants would provide a better insight into the nature of their nonverbal emotional understanding.

Conclusions

Results of the current study suggest a complex link between emotion identification and aggression. There was evidence of differences between the aggressive and nonaggressive groups in terms of their processing and interpretation of emotional cues. In practical terms, the current findings, therefore, provide some support for the inclusion of emotion education in anger management work, with an emphasis on socioemotional cues. Moreover, the results highlight the importance of assessing possible cognitive distortions in aggressive individuals (Pert et al., 1999). The nonverbal task used in this research could provide an important tool for assessing cognitive distortions in clinical practice as well as opening up a rich vein for future research. Further, the current findings suggest that the assumption underlying many augmentative communication systems, such as the Picture Communication Symbols (Mayer Johnson, 1981), that simple stimuli aids recognition (Cha & Merrill, 1994; Rojahn et al., 1995), may not be appropriate for all. Future researchers should, therefore, examine the efficacy of using such systems.

References


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