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Improving the Ability of Elementary School-Age Children to Identify Emotion in Facial Expression

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ABSTRACT. The authors evaluated an intervention program developed to remediate children's deficits in reading emotions in facial expressions. Thirty children from 2 elementary schools in suburban Atlanta participated in 6 30-min sessions over 4 weeks in which they were taught to discriminate, identify, express, and apply facial expression cues. The ability to read emotion in facial expressions significantly improved for the intervention group compared with the control group. Improvement on identifying facial expressions was associated with increased feelings of lower social anxiety and higher self-worth for girls. Boys' self-concept was negatively related to improvement. On the basis of the results, the authors suggested that structured interventions like the present one could be used to improve students' nonverbal processing abilities within public school settings, but with some cautions regarding the impact of new learning for boys.

Key words: emotion recognition, intervention, nonverbal communication

NONVERBAL PROCESSING ABILITY has been found to be associated with a variety of important personal, social, and academic outcomes with increasing regularity (Nowicki & Duke, 1992). Of all the nonverbal processing skills, the ability to read emotion in the facial expressions of others stands out as being among the most important and has received much attention from investigators (McClure, 2000). As Feldman and his colleagues (Feldman, Philippot, & Custrini, 1992) have pointed out, "The effective decoding of others' facial expressions aids in understanding the emotions experienced by other social interactants and thus in producing a more accurate cognitive representation of the social situation as a

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whole, potentially leading to more effective social interaction" (p. 331). In support of this supposition, researchers have found that the ability to read emotion in the facial expressions of others has been related (a) to personality characteristics such as self-esteem (Buss, 1989; Nowicki & Duke, 1992), locus of control (Nowicki & Duke, 1992; 1994), and depression (Nowicki & Carton, 1997); (b) to social adjustment as measured by social anxiety (McClure & Nowicki, 2001), sociometric status (Nowicki & Duke, 1994; Nowicki & Mitchell, 1998), ratings of parents (McClanahan, 1996), and judgment of teachers (Maxim & Nowicki, 1996; Nowicki & Mitchell, 1998); and (c) to academic achievement (Halberstadt & Hall, 1980; Nowicki & Mitchell, 1998).

In spite of its acknowledged importance in the lives of children, relatively little research has been directed at how to improve the facial-processing ability of those found to have deficits in this skill. Feldman, Philippot, and Custrini (1992) provided feedback to 12-year-old children about which responses to facial-expressions were incorrect and found that the feedback led to improvement in participants' ability to identify emotion in facial expressions. However, participants were not taught how to strategically identify and express specific emotions. Instead, they were shown emotions through video examples. They were then asked to repeat the procedure and match emotions to clips they had just seen, rather than apply any knowledge to a new set of stimuli or an active social situation. Feldman and colleagues also focused on only three of the four basic emotions, excluding anger—which is probably important in that it has since consistently been identified as the most difficult emotion for children to identify (Nowicki & Mitchell, 1998)

Minskoff (1980), building on the work of Johnson and Myklebust (1967), proposed an intervention framework and specific activities for correcting nonverbal processing deficiencies. Her program separated nonverbal-skill-remediation tasks into a four-stage teaching framework. The four steps had participants learning the discrimination, understanding, meaningful usage, and appropriate application of nonverbal social cues. Minskoff emphasized the need for better assessment of nonverbal skills and the development of intervention materials that would be varied and interesting enough to engage each individual child.

Nowicki (1998) used the foundation of Minskoff's intervention structure and devised a four-unit program called the Remediation of Diagnostic Analysis of Nonverbal Accuracy (R-DANVA). The program directs children through exercises, paralleling those suggested by Minskoff (1980), that augment nonverbal accuracy along a skill hierarchy beginning with discrimination, understanding, and expressive usage and ending with social application. The R-DANVA includes elements of structure, preparation, and materials that were not specifically addressed in Minskoff's model. For instance, Nowicki suggested that a group format was workable and even to be preferred in some circumstances over an individual one. He described how the sessions should be organized, who should participate, and in what numbers. Although used exten-

sively in clinical settings, the effectiveness of the R-DANVA has yet to be evaluated empirically.

Our purpose in the present study was to evaluate the effectiveness of a structured group intervention in improving the ability of children to identify emotion in facial expressions. The Emory Nonverbal Intervention program (ENVI; Grinspan, Hemphill, & Nowicki, 2000), a variant of the R-DANVA, was used with students from the third and fourth grades. We predicted that the ability to read emotion in facial expressions would improve for children who experienced the ENVI. In addition, we also predicted that improvement in the ability to read emotion in facial expressions would be associated with increased feelings of self-esteem and lower social anxiety.

Self-esteem and social anxiety were chosen because of their central role in children's ability to interact successfully with others. An important potential consequence of errors in nonverbal processing is a negative impact on self-esteem, or "the overall evaluation of one's worth or value as a person" (Harter, 1999, p. 5). Children are able to make judgments about their feelings of self-worth by the third grade (Harter, 1988), but the consolidation process is one that can last to 10 or 11 years old (Saarni, 1999). Self-concept can vary during this time depending on feedback from peers, parents, and teachers and the knowledge gained from these interactions (Saarni, 1999). Perceptions of personal value are intimately related to a host of variables, including communication skills, support from others (including peers, parents, and teachers), and social success (Duke, Nowicki, & Martin, 1996; Eisenberg, 1998; Harter, 1988, 1999). Socially successful children are not only "happy to be engaged in interpersonal pursuits . . . [often] reveal[ing] it by facial expressions, tone of voice, and general excitement" (Buss, 1989, p. 52) but are also generally happier with themselves as people (Eisenberg, 1998).

Researchers have shown that an individual's perception of how others appraise a social situation is not contingent on how others actually perceive the situation (Harter, 1999). If children are better equipped to decipher others' nonverbal cues, they will be more able to respond to peers and engage in social interaction in an appropriate manner. These accurate and informed nonverbal skills can lead to greater social competence (Eisenberg, 1998; Feldman, Philippot, & Custrini, 1992), greater prosocial tendencies (Eisenberg, 1998), and more positive self-concept (Buss, 1989; Eisenberg, 1998; Harter, 1990).

Another potential stumbling block to initiating and maintaining peer relationships is social anxiety. High social anxiety has been associated with poor social adjustment in children (LaGreca & Stone, 1993). However, the mechanism through which social anxiety negatively affects social relationships is largely unexplored. One possibility is that individuals who have high social anxiety lack the prerequisite social skills necessary to negotiate the complex relationship process effectively. There is support for the association between social anxiety and social skills when social skills are measured by the ability to read emotion in the facial expressions of others (McClure, 1997; McClure & Nowicki, 2001). In

the present study, because it was assumed that the ability to read emotion in facial expressions is associated with social anxiety, we predicted that improvement in the ability to read emotion in facial expressions would be associated with lower social anxiety.

In summary, we predicted that (a) children experiencing the ENVI intervention would improve their ability to identify emotion in facial expressions as compared with those who do not experience an intervention and (b) improvement in the ability to read facial expressions would be associated with more positive feelings of self-concept and lower social anxiety.

Method

Participants

The participants ($N = 41$) were primarily third- and fourth-grade students ($n = 38$) with 1 second grader and 2 fifth graders from two elementary schools in a middle-class suburban county of a large southeastern city; they were selected and screened for nonverbal acuity. The participants were Caucasian ($n = 38$), African American ($n = 2$), and Hispanic ($n = 1$) and ranged in age from 7.83 to 10.75 years ($M = 9.25$, $SD = 0.74$). The research pool consisted of 27 boys and 14 girls. Within each school, students were selected on the basis of teacher recommendation; membership in the Social Support Team (SST), which is made up of children who are considered to have social skills deficits; or both. Those students who scored below the mean on any section of the initial assessment were then placed into one of two groups, the intervention group or the control group. Girls ranged in age from 8.5 to 10 years ($M = 9.08$, $SD = 0.52$), whereas boys ranged in age from 8.25 to 9.17 years ($M = 8.78$, $SD = 0.36$). The DANVA2 control group ($n = 11$) was composed of students who were given only the DANVA2 tests and who ranged in age from 7.83 to 10.33 years ($M = 8.92$, $SD = 0.86$). The measures control group ($n = 6$) ranged in age from 7.83 to 9.67 years ($M = 8.57$, $SD = 0.68$) and was a subset of the DANVA2 control group. Although they did not go through the intervention, the measures control group was given the DANVA2 as well as a self-concept scale and two social anxiety scales.

Apparatus

Digital camera. A Casio digital camera was used to photograph facial expressions; the photographs were to be utilized as stimuli for teaching discrimination tasks in the intervention groups. The digital camera allowed for more efficient production of accurate stimuli.

Drawing tablet. A 45 × 60 cm spiral drawing tablet was used to illustrate and identify any relevant material for instruction in teaching facial expressions.

Facial expression deck. A 72-picture deck of facial expressions taken with a Casio digital camera and downloaded from http://www.phototogo.com was divided into four equal groups of eighteen 7.5 × 11.3 cm cards. The four groups represented the four facial expressions focused on in the study: happy, sad, angry, and fearful. Both high- and low-intensity expressions were used for each of the emotions. The deck was further divided into nine color suits on which the facial expression was attached, such that each suit contained two pictures of each emotion. The deck was partially modeled after the Mattel, Inc., UNO deck and Martin's facial stimuli (Martin, 1998). The facial expression deck was used as a game for teaching discrimination between facial expressions.

Facial zone puzzle. To teach participants to learn the components of facial expressions, we cut several photographs into the three facial zones: eyes and forehead, nose and cheeks, and mouth and chin. These zones were based on the zoning section of *Teaching Your Child the Language of Social Success* (Duke, Nowicki, & Martin, 1996). Each section of the face was made up of happy, sad, angry, and fearful stimuli cut from magazines. The aim of the facial zone puzzle was to teach children to properly identify the components of each expressive face by attaching the appropriate pieces onto a blank face. For more information on the facial zone puzzle, see the ENVI (Grinspan, Hemphill, &Nowicki, 2000).

http://www.phototogo.com. We downloaded some pictures from this site to contribute to the stimuli used in the facial expression deck.

Measures

Diagnostic Analysis of Nonverbal Accuracy Scale-Form 2. The Diagnostic Analysis of Nonverbal Accuracy Scale-Form 2 (DANVA2; Nowicki & Duke, 1994) is a research instrument designed to evaluate children's ability to accurately decode nonverbal emotional information. The scale consists of four subtests that measure nonverbal receptive abilities, including the identification of adult and child facial expressions and vocal paralanguage. Only the adult and child facial expression subtests were used in the present study.

Adult facial expressions. The Diagnostic Analysis of Nonverbal Accuracy-Form 2, Adult Facial Expressions (DANVA2-AF) consists of 24 photographs that have equal numbers of male and female adult facial expressions of happy, sad, angry, and fearful emotions (Nowicki & Carton, 1993). College-aged adults ($n = 21$) ranging in age from 18 to 29 years were read vignettes with happy, sad, angry, and fearful themes and then were photographed responding to the vignettes with appropriate facial expressions. The vignettes were selected from the expressive section of the original DANVA test (Nowicki & Duke, 1994). A sample vignette is "You have just opened a birthday present and found that it is exactly what you were hoping to

receive. It makes you very happy." There were four vignettes (two high intensity and two low intensity) for the emotions of happiness, sadness, anger, and fear.

Photographs were taken not only when adults were asked to make the appropriate facial expressions, but also spontaneously as the adults talked. The final 24 photographs were selected from a larger sample of 108 that were presented to groups of college students (n = 102) and fourth-grade students (n = 48). The two groups of students judged the intensity of the expressions on a 5-point scale, and photographs were selected only if at least 80% of the participants agreed on the emotion. The 24 photographs meeting the criteria for 80% agreement and intensity were balanced such that there were equal number of men (n = 12) and women (n = 12) as well as equal numbers of high-intensity (n = 12) and low-intensity faces (n = 12) for each emotion. There were 3 high- and 3 low-intensity faces for each emotion, which means there was not an equal number of male and female faces in each intensity group. The intensity of the facial expression was assumed to be more important to control than the gender of the model.

Construct validity data have been presented by Nowicki and Carton (1993) and in several other studies (Bailey, 1996; Baum, 1997; Collins, 1996; Goonan, 1995; Halpern, 1996; McClanahan, 1996; Mumley, 1996; Nowicki, 1995; Rowe, 1996). Convergent validity was assumed on the basis of the significant correlation between the adult facial expressions subtest and the original DANVA adult facial expressions subtest, $r(64) = .34$, $p < .01$, in a sample of college students. On the basis of the results of 10 studies, linear trend analysis showed that accuracy scores increased with age up to 33 years old. Scores have been found to be internally consistent as measured by coefficient alphas in children as young as 4 years (N = 34, $\alpha = .71$; Goonan, 1995) and as old as 15 years (N = 27, $\alpha = .78$; Baum, Logan, Walker, Tomlinson, & Schiffman, 1996). The average coefficient alpha across 10 studies was .78. Higher accuracy scores have been found to be significantly correlated with higher social competence as rated by teachers (Collins, 1996; Maxim & Nowicki, 1996) and parents (McClanahan, 1996), as well as with higher internal control expectancies (Halpern, 1996; McClanahan, 1996) and lower depression (Nowicki & Carton, 1997).

Child facial expressions. The Diagnostic Analysis of Nonverbal Accuracy-Child Facial Expressions subtest (DANVA2-CF) consists of 24 photographs of child facial expressions. Twelve boys and 12 girls are displayed with an equal number of high- and low-intensity happy, sad, angry, and fearful faces. During test administration, the photographs are presented one at a time for a 2-s exposure period. The participant is then asked to identify the facial expression as happy, sad, angry, or fearful.

Children between 6 and 10 years old (N = 18) were read vignettes with happy, sad, angry, or fearful themes and were asked to respond with the appropriate facial expressions. The children were then photographed so that there were a total of 118 pictures to choose from for a final set. The final 24 photographs were selected after they were presented to samples of college students (N = 102)

and fourth graders ($N = 48$). The samples judged each photograph on a 5-point scale on whether it showed a happy, sad, angry, or fearful expression and on the photograph's emotional intensity. For a photograph to be included in the final set, at least 80% of the judges had to agree on the depicted emotion. The final 24 photographs included equal numbers of male, female, high-intensity, and low-intensity faces. There were three high- and low-intensity faces for each of the four emotions included in the DANVA2-CF subtest.

Evidence of the DANVA2-CF's reliability and construct validity is available from numerous studies (Clark, 1993; Goonan, 1995; Halpern, 1996; McClanahan, 1996; Nowicki, 1995; Rowe, 1996; Stillion, 1996; Verbeek, 1996). Acceptable levels of convergent validity were indicated by significant correlation between scores from the DANVA2-CF and scores from the original DANVA2 child faces test, $r(101) = .54$, $p < .01$, in children ($M = 8.20$ years). Linear trend analysis from the results of eight studies indicated that accuracy scores increase with age. Nowicki and Carton (1993) also obtained coefficient alphas ranging from .70 in first-grade students ($n = 49$) to .76 in fifth graders ($n = 26$), indicating acceptable internal consistency. Higher accuracy scores on the DANVA2-CF were significantly and positively correlated with social acceptance, as rated by teachers (Collins, 1996; Maxim & Nowicki, 1996) and parents (McClanahan, 1996) and with greater internal control expectancies (Halpern, 1996; McClanahan, 1996; Nowicki & Carton, 1997). The DANVA2-CF now has been utilized in more than 135 studies at the masters, doctoral, and postdoctoral levels (Nowicki, 2000).

Self-perception measure. We chose 17 items from the Self-Perception Profile for Learning Disabled Students (SPPLDS; Renick & Harter, 1988) and the Social Support Scale for Children (SSSC; Harter, 1985) to form a briefer 34-item measure, called the Self-Concept Scale (SCS), and to assess children's perceived support, positive regard, competence, and global self-worth. Items were chosen on the basis of their relevancy to self-concept and social support in both peer and adult relations. Construct validation evidence was strong for both the SPPLDS and the SSSC, especially in terms of reliability (Harter, 1985; Renick & Harter, 1988), so that shortening the scales would not seriously compromise that test attribute. For each item, the child is presented with two alternatives (e.g., "Some kids find it hard to make friends, BUT for other kids it is pretty easy"). First, participants must decide which statement better describes them, and then they must report whether that statement is sort of true or really true for them. Items are scored on a 1–4 point scale, with scores of 4 indicating high perceived competence and scores of 1 indicating low perceived competence. The questionnaire is made up of three domains: total self-concept, which is comprised of all 34 items; total self-perception, which is comprised of the 17 SPPLDS items; and total perception of social support, which is comprised of the 17 SSSC items.

Social Anxiety Scale for Children-Revised (SASC-R; LaGreca & Stone, 1993). The SASC-R is a self-report measure consisting of 22 items. The items are

designed to measure three factors: fear of negative evaluation in social situations (FNE), behavioral consequences of anxiety such as social avoidance and distress that is specific to situations with peers (SAD-N), and social avoidance or distress that is more generalized (SAD-G). A score can be computed for each of the subscales and as a total score.

LaGreca and Stone (1993) have reported satisfactory coefficient alphas for each of the three subscales in a sample of 587 elementary-school-aged children: .86 for FNE, .78 for SAD-N, and .69 for SAD-G. Earlier forms of the test showed satisfactory test–retest reliability over a 2 week period, $r = .67$, $n = 102$. Convergent validity is shown by significant correlations between the scale and the Revised Children's Manifest Anxiety Scale, $r = .57$, $n = 67$.

Procedure

Approval to have children participate in our research was obtained from the Department of Psychology and the Institutional Review Board of Emory College.

Selection process (2 weeks). Teachers and school guidance counselors recommended children from Grades 3 and 4 on the basis of observations of social distress. Children who returned signed permission slips or who had SST standing were tested, and students whose scores fell below the mean error scores for 8- and 9-year-old-children were included. Two children (1 boy and 1 girl) at one elementary school were selected on the basis of special recommendation of school personnel despite having somewhat higher DANVA2 scores. School personnel believed that the children could benefit from the group experience and might be able to improve their performance even more.

Pretesting (2 weeks). Members of a graduate student's lab at Emory University assisted the two primary investigators in test administration. In addition to the DANVA2 testing given in the selection process, children also were administered the 22 items from the SASC-R and the 34 items from the SSC. The items were read aloud to control for reading difficulties.

Group formation. Composition of intervention groups was assigned on the basis of somewhat different criteria at the two schools. Children at Murdock Elementary School ($n = 12$) were separated into two equal groups on the basis of gender, the Murdock girls group ($n = 6$) and the Murdock boys group ($n = 6$). Children at Davis Elementary School ($n = 18$) were randomly assigned to two groups. The Davis mixed group consisted of 3 girls and 6 boys, and the Davis boys group consisted of 9 boys.

Group sessions. The primary investigator assigned to each school met with the participants over a 4-week period of time, once or twice a week, for a total of six sessions. Sessions were about 30 min in length. Sessions covered four stages: discrimination, understanding, expressive usage, and application of nonverbal facial

expressions. Complete descriptions of the intervention program can be obtained from the third author.

Posttesting. The primary investigators administered the pretest measures, including the DANVA2, the week following the last session. After posttesting, students were rewarded with a small gift for their participation.

Parents were mailed descriptions of the findings of the study and invited to call or send e-mail to the experimenters with questions or for more information. With approval of parents, experimenters also debriefed teachers on the results of the present study.

Results

We computed a series of independent-samples t tests to investigate the possible association of DANVA2 scores with gender or school attended. None of the tests were significant. An analysis of variance (ANOVA) on the DANVA2 improvement scores of each of the four intervention groups also was nonsignificant, $F(3, 29) = 2.15, p > .05$. Because of the lack of significant differences among the intervention groups, they were collapsed for further statistical analysis.

Hypothesis 1: Children experiencing the ENVI intervention will improve their ability to identify emotion in facial expressions as compared with those who do not experience an intervention.

The t test computed between the pre–post mean difference in total errors for the intervention ($M = 5.27$, $SD = 3.88$) and comparison ($M = -1.08$, $SD = 0.44$) groups was significant, $t(39) = 5.76$, $p < .01$. This result supports the prediction that the intervention was successful in helping children to be more adept at identifying emotion in facial expressions. The intervention was successful compared with the comparison group in improving the ability to identify emotion in the facial expressions of both children (intervention group, $M = 2.24$, $SD = 0.87$, vs. comparison group, $M = -0.82$, $SD = .32$; $t(39) = 5.23$ $p < .01$) and adults (intervention group, $M = 3.03$, $SD = 1.18$ vs. comparison group, $M = -0.16$, $SD = 0.11$, $t(39) = 5.45$, $p < .01$).

Hypothesis 2: Improvement in the ability to read facial expressions will be associated with more positive feelings of self-concept and lower social anxiety.

Before evaluating Hypothesis 2, we conducted two independent-samples t tests to evaluate social anxiety and self-concept score improvement across the participant's school, gender, and intervention versus control status. None of the t tests was significant. One-way ANOVAs computed on differences among the intervention groups on social anxiety as measured by any of the three subscale

scores and on self-concept scores were not significant. The intervention groups were collapsed for further analyses.

Hypothesis 2a (*self-concept*): Consistent with the hypothesis, the correlation between the differences in social anxiety as measured by FNE and the ability to identify emotion in facial expressions was negative and significant, $r(29) = .38$, $p < .05$. As children were able to improve their ability to read emotion in facial expressions, their social anxiety as measured by FNE became lower.

Hypothesis 2b (*social anxiety*): The prediction that self-concept scores would improve significantly with improved ability to read emotion in facial expressions received partial support. We computed correlations to determine the relationship between DANVA2 improvement scores and changes on the combined self-concept. These results provided partial support for the hypothesis but only when the intervention participants were separated by gender. Consistent with the hypothesis, the girls showed a significant positive correlation between changes in self-concept as measured by total self-concept scores and changes in the ability to read emotion in facial expressions, $r(8) = .74$, $p < .05$. Surprisingly, the boys had a significant but negative correlation between their self-concept scores as measured by total self-concept scores and facial expressions, $r(20) = -.51$, $p < .01$.

Discussion

An intervention program based on the principles of directly teaching children how to read facial expressions successfully improved children's ability to identify emotions in both adult and child faces. DANVA2 improvement scores were significantly greater than those of the comparison group across adult and child faces. This study is one of the first successful attempts to evaluate the ease with which facial processing skills can be improved. The present program, the ENVI, was presented for only six 30-min periods, once or twice a week, during 4 weeks. Furthermore, the program was administered by undergraduate college students, not by fully trained professionals. These results suggest that children may be able to improve their basic facial processing skill if it is directly taught according to certain structural principals implicit in the ENVI.

The impact of improved performance varied between girls and boys. Consistent with predictions, improvement in the ability to identify emotion in facial expressions was associated with positive changes in social anxiety and self-concept for girls. Although these positive changes were predicted, it is still impressive that they occurred after such a relatively brief period of time. Self-concept is going through change and modification during this period of development, and it appears that gaining skill in processing emotional information from others is a potentially significant agent of change (Harter, 1999). The positive relationship found with girls could become stronger over time as their improved nonverbal

ability affects ongoing social interactions. Future researchers should seek, first, to find out the nature of time and intensity of intervention and the changes in personal and social behavior association, and second, to measure the impact of interventions on participants' personality and interpersonal functioning at different lengths of time after the end of the remediation procedures.

Although improvement in identifying emotion in facial expressions was related to lower social anxiety in boys, as was expected, we found the improvement to be related to a more negative self-concept. One plausible explanation for this unexpected finding is that although boys may have felt less anxious about social situations, they also now could read what others were feeling about them and it was not positive. Making boys aware of the emotional reaction of others appears to be a double-edged sword. On the one hand, it is realistic and useful information that they can use about how they are doing interpersonally. On the other hand, if they are doing poorly, such new information can make them feel badly about themselves. Although realistic self-appraisal is the first step toward making the necessary behavioral adjustment to improve boys' social interactions, it appears that such information may initially make them vulnerable to negative feelings about themselves. There is evidence that boys are more vulnerable to a variety of physical and psychological difficulties during their childhood than girls (Saarni, 1999), and dealing with emotional feedback from peers may be another such difficulty. If this is so, then interventions that are focused on dealing with emotional feedback must help boys (and the adults who teach and parent them) learn to incorporate this information without long-lasting negative consequences. Perhaps adding sessions that focus on what to do with the new information would be useful.

In addition, to more fully evaluate the impact of the ENVI on social success, future interventions may consider including other outcome measures and ways of assessing emotions in facial expressions. Faces that include more subtle or mixed emotions would help to extend the processing skill of children. Teacher evaluations of participants before the intervention and consistent repeated teacher assessments of participants after the intervention may provide a potentially richer and more valid measure of the ENVI's efficacy and impact on enduring social relationships. Parent and peer evaluations along with systematic unobtrusive behavioral observations of target children also might be helpful in evaluating impact.

To evaluate the role of others' attention on children's ability to identify emotion in facial expressions, researchers should include a comparison group in which participants would be engaged in general fun activities with experimenters in future studies. Although such activities may make participants feel better, it is difficult to see how that would translate into the specific improved skill in reading nonverbal cues. In any case, the present study is only the first of what needs to be a sequence of investigations that seek to illuminate the best ways to intervene and the short- and long-term impact of the interventions. Until these studies are completed, the findings must be taken and used cautiously.

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