Enhancing Appropriate Social Behaviors for Children with Autism in General Education Classrooms: An Analysis of Six Cases

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Abstract: This study compares generalized effects of a social-emotional skills training for girls and boys with autism in resource rooms on promoting positive social behaviors in general education classrooms in Taiwan. A single subject design was used to compare outcomes for 2 girls and 2 boys with autism in the experimental group with 2 boys with autism in the control group. Results of regression analyses revealed that all 4 participants in the experimental group significantly increased frequencies of positive social behaviors over time, while the two control participants did not demonstrate trends in the data. After adjusting for trends, the training had a medium effect size for 2 participants and a small effect size for 2 participants in the experimental group. This training was developed in response to educational services in Taiwan; suggestions are provided for development of interventions for children with autism that fit within general education classrooms.

It is well known that many persons with autism have social and emotional difficulties (Hauck, Fein, Waterhouse, & Feinstein, 1995; Hobson, 1986; Hobson & Lee, 1998; Kanner, 1943). Research has demonstrated that individuals with autism display significant deficits in social skills (Hobson & Lee, 1998; Njardvik, Matson, & Cherry, 1999), judgments of social appropriateness (Loveland, Pearson, Tunali-Kotski, Ortegon, & Gibbs, 2001), imitation (Hobson & Lee, 1999; Stone, Ousley, & Littleford, 1997), joint attention (Charman, Suttenham, Baron-Cohen, Cox, Baird, & Drew, 1997), and social initiation with peers (Hauck et al.). In addition, research has demonstrated that individuals with autism may display marked impairment of emotion including understanding facial expression (Braverman, Fein, Lucci, & Waterhouse, 1989; Celani, Battacchi, & Arcidiacono, 1999; Hobson, 1986; Klin, Sparrow, de Bildt, Cicchetti, Cohen, & Volkmar, 1999), cause of affect (Jaedicke, Stokesch, & Lord, 1994), empathy (Dyck, Ferguson, & Shochet, 2001; Yirmiya, Sigman, Kasari, & Mundy, 1992; Yirmiya, Sigman, & Zacks, 1994), affect processing capacities (Greenspan, 2001), and inappropriate affect (McGee, Feldman, & Chernin, 1991; Snow, Hertzig, & Shapiro, 1987).

In regard to social skills, a variety of interventions have been implemented over the past 20 years to remediate social deficits for individuals with autism (Krantz & McClannahan, 1998; Mesibov, 1984; Williams, 1989). For example, Mesibov taught 15 adolescents and adults with autism social skills including group discussion, listening and talking, role-playing, and appreciation of humor. Feedback from participants and their families demonstrated that participants improved their conversational skills, selection of relevant topics, and perceptions of themselves. Williams implemented a social skills training for adolescents with autism that included cooperative games, asking for help, and holding a conversation with results indicating an overall improve-
ment in peer relationships for participants. In another study on social skill training (Cheek, Logan, Sprecher, & Streitmatter, 1997) that included listening, cooperative learning, and monitoring inappropriate behaviors, findings demonstrated that participants improved on social skills and academic performance with listening skill behaviors increasing notably. These authors suggested that listening was the most beneficial social skill taught in this program for these students. In another approach to social skill instruction, Krantz and McClannahan used a script-fading procedure involving adult language models to increase participants’ social exchanges.

In addition to a variety of approaches to social skills training, research has also examined effectiveness of adult mediated and peer-mediated training in social skills (Goldstein, Kaczmarek, Pennington, & Shafer, 1992; McGee, Almeida, Sulzer-Azaroff, & Feldman, 1992; Roeyers, 1996; Weiss & Harris, 2001). Limitations to adult-mediated approaches have included the possible intrusiveness of interactions, alteration of the nature of interactions; and, if used in isolation, encouragement of dependence of children with autism on adults (Weiss & Harris). As a result, Weiss and Harris suggested that intervention research has shifted in focus to more peer-mediated interventions.

Research has also examined impairment of emotion for individuals with autism (Braverman et al., 1989; Celani et al., 1999; Hobson, 1986; Klin et al., 1999), including flat/neutral emotion (Yirmiya, Kasari, Sigman, & Mundy, 1989). Children with autism also perform less well than children without disabilities on perspective-taking and empathy-related tasks (Bauminger, 2002; Dyck et al., 2001; Gena, Krantz, McClannahan, & Poulson, 1996; Yirmiya et al., 1992, 1994). And, while research has demonstrated that individuals with autism respond to training on contextually appropriate affective behaviors such as talking about favorite things and showing sympathy (Gena et al.), when children with autism demonstrate positive affect, it is less likely to convey communicative intent and be partner-related in comparison to normally developing peers (Dawson, Hill, Spencer, Galpert, & Watson, 1990; Jaedicke et al., 1994; McGee et al., 1991; Snow et al., 1987).

Recently, interventions on emotion have focused on enhancement of emotional competence via teaching “theory of mind” (e.g., Hadwin, Baron-Cohen, Howlin, & Hill, 1996; Howlin, Baron-Cohen, & Hadwin, 1999; Ozonoff & Miller, 1995). For example, Hadwin et al. provided training on theory of mind tasks to thirty children with autism that included facial recognition of emotion; as well as situation-based, desires-based, and belief-based emotions. Results demonstrated that children with autism could be taught to pass tasks that assess emotion and belief understanding. However, teaching effects did not generalize to untaught domains of tasks and no significant progress in spontaneous pretend play from teaching was found. The authors suggested that children with autism might be passing tasks using rules rather than a genuine understanding of emotions, belief, and pretence.

Furthermore, research has studied associated factors with peer social interaction, and a number of social and emotional factors such as joint attention (Charman, 2003; Whalen, 2001), imitation (Charman; Field, Field, Sanders, & Nadel, 2001; Stone et al., 1997), and affect comprehension (Braverman et al., 1989) have been found to be related to social interaction. For example, Charman found that joint attention ability skills (the coordination or sharing of attention between the child, another person, and an object or event in a social context) were positively associated with language gains and social and communication symptoms. Whalen taught four children with autism joint attention including responding to the showing, pointing, and gaze shifting of adult, coordinated gaze shifting, and pointing (with the purpose of sharing). She found that joint attention behaviors could be trained in children with autism; and that participants demonstrated collateral changes in social initiations, positive affect, empathic response, imitation, and language.

In addition to attention and imitation skills, research has also revealed an association between affect skills and social behaviors. Braverman et al. (1989) found that children with pervasive developmental disorders (PDD) were impaired on face and affect matching in comparison with normal controls. In addition, face and affect matching were significantly
related to mental age, as well as social behavior and play. Travis, Sigman, and Ruskin (2001) investigated the relationships between social understanding (false belief understanding, affective perspective taking) and social responsiveness (empathy, concern to distress, and initiating joint attention) with social interaction including level of engagement with peers on the playground and prosocial behavior in a structured laboratory task. They found that initiating joint attention and empathy were significantly related to two social interaction behaviors for children with autism.

In summary, although research has revealed positive results for increasing social and emotional abilities for individuals with autism, generalization of social and emotional abilities to natural settings has been an issue with children with autism failing to transfer and implement their learned skills to other domains or settings that were not directly taught (e.g., Hadwin et al., 1996; Ozonoff & Miller, 1995). Therefore, the social-emotional skills intervention of the present study was designed and implemented to address several issues. The curriculum was specifically designed for use within an existing public school service delivery system for students with autism in Taiwan. This curriculum used small group instruction and addressed functional social and emotional classroom behaviors within a Taiwanese cultural framework (Stevenson & Stigler, 1992). Several important skills were taught in this intervention including attention skills, imitation and following instruction, greeting skills, emotional recognition, and emotional expression. The purpose of this study was to compare generalized effects of a social-emotional skills training for girls and boys with autism in public school resource rooms on promoting positive social behaviors in general education classrooms in Taiwan.

Method

Participants

Participants were two girls and four boys from six public elementary schools in a large, urban city in south Taiwan who had been clinically diagnosed as having autistic disorders since early childhood. They attended both home school, general-education classrooms for most of their education, as well as a resource room for students with autism part-time (4-6 hours per week). The resource rooms were located in four public elementary schools and were not home schools for these students. These students were matched by their gender, verbal ability, nonverbal ability, severity of autistic symptoms, and age. There were two trials of participants. The first trial, Jane, Jack, and John, have autism and mental retardation. They understood simple commands but had very limited expressive language using only two word phrases (Subject + Verb or Verb + Object). The second trial, Debbie, David, and Dan were high functioning children with autism (a verbal IQ above 70). They were verbal and could answer simple questions in complex sentences. Due to very few girls with autism (only \( n = 4 \)) in this city both were placed in the elementary regular classroom and the resource room, and there are no comparison participants for the girls with autism.

Students’ age ranges from 7 years 9 months to 9 years 9 months. Since Jane, Jack, and John were not testable using the Wechsler Intelligence Scale for Children-3rd edition, the Test of Nonverbal Intelligence-2 (TONI-2) and the Peabody Picture Vocabulary Test-Revised (PPVT-R) were used to estimate participants’ nonverbal and verbal abilities. The nonverbal IQ on TONI-2 ranged from 68 to 105. The verbal ability on the PPVT ranged from > 55 to 95 (see Table 1). The lowest score obtainable on the PPVT in Taiwan is a standardized norm of 55. Edelson, Edelson, and Jung (1998) reported that the mean score of individuals with autism for TONI-2 in Taiwan (\( M = 90.10, SD = 19.14 \)) is similar to the US sample (\( M = 88.99, SD = 21.13 \)) and the mean score for individuals with mental retardation is 66 in the US sample (Brown, Sherbenou, & Johnsen, 1990).

Instrument

The Behavior Record Form (BRF) was developed to document students’ daily progress in regular classrooms. This form described five positive social behaviors:

1. Student plays with classmates during the breaks today.
2. Student agrees to join in a game or an
3. Student shares goods with classmates or accepts classmates to join in his/her activity today.
4. Student initiates to play with classmates today.
5. Student follows the rules of games today.

Event recording was used for this form (Alberto & Troutman, 2002). A pilot study for reliability of BRF was conducted with 15 boys and three girls with autism ranging in age from 6 years 6 months to 9 years 9 months, rated by their regular homeroom teachers. Alpha coefficients were .91 with test-retest reliabilities for two days at .90 and two-week interval .80. Interrater reliability was collected by sampling over 30 days and having two raters rate the same student simultaneously resulting in a correlation coefficient for the total scale of .775 (p < .000).

Procedure

Homeroom teachers of participants were asked to record students’ behavior on the BRF from Monday to Friday when students with autism attend regular classrooms. Identical instructions were given to all teachers in administering the BRF. While homeroom teachers were aware that a program was in effect in the resource rooms of the students, teachers were unaware of when the intervention was implemented as well as students’ placement in either the treatment or control group.

Social-emotional skills training was conducted in two resource rooms in two separate schools for 80 minutes per week for 13 weeks. Three to four students with autism were taught together. Some children with autism in the intervention group did not participate in this study due to disagreement by their parents. For the control group, a general remedial education curriculum was maintained. The teaching method used in resource rooms for children with autism in this city was primarily individualized instruction. Small group instruction was used only for training sessions for the experimental group. Both groups of students had equal opportunity to interact with students without disabilities in general education classes throughout the week. All students in Taiwan typically attend school five days a week and alternate spending four hours Saturday morning in social/sports/artistic activities every other week.

Design

An AB single subject design was used to assess relative effectiveness of intervention. The first week of the semester consisted of baseline (5 data points). In baseline, a regular remedial education curriculum was implemented in resource rooms for both the experimental group and the control group. After baseline, training sessions were conducted in two resource rooms in two separate schools for 80 minutes per week for a total of 13 weeks (61 data points). For the control group, a regular remedial education curriculum was maintained. Both groups of students had equal opportunity to interact with students without disabilities in general education classes throughout the week.

Intervention

Social-emotional skills curriculum. The social-emotional curriculum was developed by Yang, Huang, and Wang (2003) to teach children with autism social and affect skills. The overall purpose of this curriculum was to assist children with autism to integrate into general education classrooms and focused on helping

<table>
<thead>
<tr>
<th>Name</th>
<th>Group</th>
<th>Age (y/m)</th>
<th>PPVT-R</th>
<th>TONI-2</th>
</tr>
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<tr>
<td>Jane</td>
<td>Experiment</td>
<td>9/9</td>
<td>&gt;55</td>
<td>74</td>
</tr>
<tr>
<td>Jack</td>
<td>Experiment</td>
<td>9/9</td>
<td>&gt;55</td>
<td>77</td>
</tr>
<tr>
<td>John</td>
<td>Control</td>
<td>9/4</td>
<td>&gt;55</td>
<td>68</td>
</tr>
<tr>
<td>Debbie</td>
<td>Experiment</td>
<td>8/1</td>
<td>70</td>
<td>88</td>
</tr>
<tr>
<td>David</td>
<td>Experiment</td>
<td>7/9</td>
<td>95</td>
<td>104</td>
</tr>
<tr>
<td>Dan</td>
<td>Control</td>
<td>8/6</td>
<td>78</td>
<td>105</td>
</tr>
</tbody>
</table>

Note. PPVT = Peabody Picture Vocabulary Test-Revised; TONI-2 = Test of Nonverbal Intelligence-2.

In Taiwan, the lowest score obtainable on the PPVT is a standardized norm of 55. Mean score of individuals with autism for TONI-2 is 90.1 (SD = 19.14) (Edelson et al., 1998).
children with autism to reducing the discrepancies between their social-emotional level and intellectual level. The curriculum includes 12 units: (1) paying attention, (2) imitation and following instructions, (3) knowing one’s own and another student’s name, (4) recognition of one’s own and another’s belongings, (5) knowing one’s own and another’s gender, (6) expressing one’s preferences, (7) introducing one’s self to others, (8) recognizing happy and unhappy faces, (9) recognizing one’s own and another’s feelings of happiness and sadness, (10) recognizing one’s own and another’s feelings of fear, (11) recognizing one’s own and another’s feelings of anger, and (12) tolerating frustration.

Six units (1, 2, 3, 4, 5, 7) were on social skills, four units (8, 9, 10, 11) addressed affective skills, and two units (6, 12) addressed both social and affect skills with each unit building on the previous unit. In addition, each unit had several objectives with objectives arranged from simple to more difficult.

For social skills, for instance, unit seven "introducing one’s self to others" addressed ten objectives: (a) when asked student can answer with his name, (b) student can respond with another student’s name after hearing that student’s introduction, (c) with a teacher prompt student can introduce his/her name, age, school, and grade in a group, (d) student can ask another student’s name with teacher prompt, (e) student can ask an other student’s information such as name, age, school, and grade with teacher prompt, (f) student can tell his/her own interests to another student with teacher prompt, (g) student can respond with an other student’s interests with teacher prompt, (h) student can introduce himself/herself in a group and include three personal attributes (including basic information and interests) without teacher prompt, (i) student can introduce himself/herself in a group and include four attributes without teacher prompt, and (j) student can remember and respond with an other student’s information such name and attributes after hearing an other student’s introduction without teacher prompt.

For affective skills, for example, unit eight "recognizing happy and unhappy faces" consisted of six objectives. The first objective was to recognize simple line drawings of happy or unhappy faces (e.g., 😊 and 😂). The second objective asked students to recognize happiness and unhappiness from complex line drawings of people. Next, students were asked to sort pictures of happiness and unhappiness. The fourth objective asked students to match emotions from videotapes to pictures of emotion exhibited on student’s work sheet. A popular cartoon in Taiwan was used for this activity. For the fifth objective the teacher modeled happy and unhappy faces, gestures, and voices for students to simulate. The final objective was for students to identify if a teacher’s or classmate’s faces were happy or unhappy.

Selection of curricular activities was age-appropriate, functional, and socially valid for Taiwan. For example, curricular activities common in Taiwanese schools include a focus on group instruction and teacher-led activities, and working and attending as a class in general education classrooms (Stevenson & Stigler, 1992). Therefore, the curriculum was developed to use small group instruction of children with autism in resource rooms to assist in developing attending behaviors, social skills, and affect skills for facilitating working as a class in general education classrooms. For example, there are 12 activities in Unit 7 “introducing one’s self to others.” The first activity was for the teacher to ask each student questions related to background information such as name, age, grade, school, etc. Students were asked to practice the whole sentence not just single words. For the second activity, the teacher wrote sentences with blank spaces on the black board and asked students to copy the sentences onto their work sheet. Questions could be changed based on students’ ability. Students were asked to fill in the blank space. After filling in the blanks, students said their answers in the group. The work sheet served as a visual prompt for students. Then, students practiced fading the work sheet as a prompt.

Training procedures. The training used small group instruction (3 to 4 students). Teaching techniques included direct instruction, modeling, role-play, visual cues, rehearsal, and reinforcement procedures. Curricular objectives of each unit served as checklists for resource room teachers to determine individual student baseline performance prior to implementing the curriculum. Although objectives
of the social-emotional skills curriculum also included objectives of individualized instruction for lower functioning children with autism, the training started from objectives of group instruction (i.e., Unit One objective (f) the student while in a group can look at the teacher when she/he said “look [attention please]”). Teachers followed the 12 units of the curriculum in a spiral sequence (Poplin, 1988) moving from lower objectives of lower units to lower objectives of more advanced units, then to higher objectives of lower units, and finally higher objectives of advanced units.

Data Analyses

Kazdin (1982) has suggested use of statistical analyses for single-case research when there are unstable baselines and large variability of behaviors in open field settings. Statistical analyses including regression and effect sizes suggested by Kromrey and Foster-Johnson (1996) were employed for the analyses of data using SAS. First, two regression models including single regression line ($y = b_0 + b_1T + e$) and parallel regression lines ($y = b'_0 + b'_1T + b'_2X + e$) were conducted separately to determine the extent to which regression lines could fit the data points on positive social behaviors.

In addition, effect size for each participant was calculated. Kromrey and Foster-Johnson (1996) suggest that the $d$ index is useful for single-subject data when the data do not show trends. When the data evidence a trend, the index $f^2$ for change in level was recommended. The effect size for change in level ($f^2$) was obtained from the difference between the $R^2$ of equations of single regression line and parallel regression lines, that is, $f^2 = (R^2_2 - R^2_1) / (1 - R^2_2)$ (Center, Skiba, & Casey, 1985/86; Kromrey & Foster-Johnson). For effect size index $f^2$ for changes in level, Cohen (1988) and Kromrey and Foster-Johnson have suggested that the values of .02, .15, .35 represent small, medium, and large effects, respectively.

Results

Table 2 delineates a mean score for each week (total 14 weeks) for participants on positive social behavior. Figures 1 and 2 provide a graphic display of data for autism group (Jane, Jack, and John) and high-functioning autism group (Debbie, David, and Dan). The coefficients of determination ($R^2$) are used to de-

<table>
<thead>
<tr>
<th>Table 2</th>
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<tr>
<td>Mean Scores by Week on Positive Social Behavior for Participants</td>
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<table>
<thead>
<tr>
<th>Week</th>
<th>Jane</th>
<th>Jack</th>
<th>John</th>
<th>Debbie</th>
<th>David</th>
<th>Dan</th>
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<tbody>
<tr>
<td></td>
<td>n</td>
<td>M</td>
<td>n</td>
<td>M</td>
<td>n</td>
<td>M</td>
</tr>
<tr>
<td>1</td>
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<td>4.40</td>
<td>5</td>
<td>15.40</td>
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<td>5.50</td>
<td>5</td>
<td>9.80</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>12.20</td>
<td>5</td>
<td>6.50</td>
<td>5</td>
<td>14.80</td>
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<td>5</td>
<td>5.40</td>
<td>5</td>
<td>16.00</td>
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<td>5</td>
<td>13.20</td>
<td>5</td>
<td>5.25</td>
<td>5</td>
<td>14.00</td>
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<tr>
<td>6</td>
<td>1</td>
<td>11.00</td>
<td>1</td>
<td>1.00</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>12.00</td>
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<td>5</td>
<td>9.40</td>
<td>5</td>
<td>17.00</td>
</tr>
</tbody>
</table>

Note. $n$ = number of days. Week 1 was baseline phase and weeks 2 to 14 were the intervention phase.
Figure 1. Frequency of positive social behavior for experimental participants with autism Jane, Jack, and John.
Figure 2. Frequency of positive social behavior for experimental high-functioning participants with autism Debbie, David, and Dan.
termine the extent to which regression lines could fit the data. Results reveal that all participants in the experimental group, Jane, Jack, Debbie, and David, statistically significantly increased their frequencies of positive social behavior over time using single regression lines (see Table 3) or parallel regression lines (Table 4) to fit the data points. The coefficients of determination ($R^2$) suggest that the parallel regression model fit the data better than the single regression model. Participants obtained higher $R^2$ values for the parallel regression lines, with $R^2$ values of .662, .227, .191, and .450 for the experimental group, Jane, Jack, Debbie, and David, respectively. In contrast, two control participants, John and Dan, did not show obvious trends for the data using two regression models for simulation, with $R^2$ values for the parallel regression model of .013 and .041 for John and Dan, respectively.

For effect sizes, the index $f^2$ associated with the change in level after adjusting for trend were .16, .02, .09, and .21 for the experimental group, Jane, Jack, Debbie, and David, respectively. For the control group, the effect sizes were .01 for John and .04 for Dan. Results reveal that after adjusting for the trend, the intervention had a medium effect size for Jane and David and a small effect size for Jack and Debbie. For the control group, John and Dan’s changes were not statistically significant on increasing positive social behavior.

**Discussion**

Results demonstrate that all four participants in the experimental group significantly increased frequencies of positive social behaviors over time, while the two control participants did not demonstrate trends in the data. After adjusting for trends, the training had a medium effect size for Jane and David and a small effect size for Jack and Debbie.

These findings suggest that social and emotional skills can be taught to children with autism and that outcomes in more positive behaviors can be generalized to general education settings. There are a number of factors in comparing results from this study with other research. For example, while adult-mediated approaches to training of social skills have been noted for their limitations (Weiss & Harris, 2001), use of adults as mediators in this study appears to support findings from other research in which adult-mediated training was effective (e.g., Haring & Lovinger, 1989; Mesibov, 1984; Odom & Strain, 1986; Williams, 1989). A possible explanation for this is the similarity of settings. In this study, participants were taught in resource rooms and assessed in general education settings, and there were similar contexts between these two settings in Taiwan. Both resource rooms and general education classrooms were located in public schools (as opposed to training located in a clinic-based setting) and included teacher directed group instruction. This may have increased stimulus similarity for participants. Handleman and Harris (1983) also noted that children with autism generalized more responses when taught in multiple classrooms, and that stimulus similarity of instructional settings may have accounted for the rates of generalization in their study.

Another factor is the intervention in this

**TABLE 3**

<table>
<thead>
<tr>
<th>Name</th>
<th>$F$</th>
<th>$p$</th>
<th>$R^2$</th>
<th>$b_0$</th>
<th>$b_1$</th>
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<tbody>
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<td>93.383</td>
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<td>.609</td>
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<td>.118</td>
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<tr>
<td>Jack (Exp.)</td>
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<td>.071</td>
<td>.020</td>
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<td>John (Cont.)</td>
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<tr>
<td>Debbie (Exp.)</td>
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<td>.118</td>
<td>13.069</td>
<td>.048</td>
</tr>
<tr>
<td>David (Exp.)</td>
<td>27.002</td>
<td>.000</td>
<td>.333</td>
<td>4.392</td>
<td>.115</td>
</tr>
<tr>
<td>Dan (Cont.)</td>
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<td>.802</td>
<td>.001</td>
<td>6.544</td>
<td>.006</td>
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</table>

Note. $y = b_0 + b_1T + e$. Enhancing Appropriate Social Behaviors / 413
study incorporated affect skills such as emotional recognition and emotional expression that may have assisted participant’s understanding of their and other’s feelings and may have motivated them to join or initiate an interaction with peers in general education classrooms. This finding was consistent with Bauminger’s (2002) study in which she implemented a social-emotional intervention with a focus on interpersonal problem solving (13 social initiation skills), affective knowledge (sad, happy, afraid, and angry), and social interaction with high-functioning children with autism. Results indicated that participants improved on ability to share experiences with peers and to show interest in peers, and participant’s ratings on social skills by teachers increased.

Finally, while this study did not incorporate an intervention developed along “theory of mind” practice (Hadwin et al., 1996; Howlin et al., 1999; Ozonoff & Miller, 1995) it did incorporate skills related to facial recognition of emotion and situation-based emotion. While it appears that participants may have generalized teaching effects to general education classrooms, it is not known if participants were using rules rather than a genuine understanding of emotions and belief as Hadwin et al. (1996) suggested in their study.

**Limitations**

This study has several limitations to its interpretations, generalizations, and conclusions. One limitation is that this was a single subject study and the sample size was small. In addition, participants were not randomly assigned to experimental and control groups, but a matched sample was used. Therefore, generalization to other children with autism is limited. Another limitation is that this study asked homeroom teachers to rate participants’ social interaction behaviors in general education classrooms, and their perceptions of students’ classroom behaviors may be impacted by their personal characteristics. Finally, the implementation of an intervention combining social and affect skills increases the difficulty in pinpointing specific components directly responsible for change in participants. And, while the finding in this study of participants in the experimental group improving on social behaviors is consistent with Bauminger’s (2002) finding, it may be the combination of all aspects of the intervention that caused change.

**Considerations for Future Research**

There are several considerations for future research. Participants in this study were assessed for one semester, and it is important to assess whether improvement of social-emotional skills and durability of treatment effects would be maintained over an extended follow-up period. Future research could also examine which social-emotional skills contribute to peer social interaction most; and additional studies could investigate group approaches to social-emotional skills training for children with autism. As noted previously, this type of

<table>
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<th>Name</th>
<th>F</th>
<th>p</th>
<th>$R^2$</th>
<th>$b_0$</th>
<th>$b_1$</th>
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</table>

Note. a. $y = b_0 + b_1 T + b_2 X + e$.  
For Baseline data, the equation is $y = b_0 + b_1 T + e$.  
For Intervention data, the equation is $y = b_0 + b_1 T + b_2 + e$.  

TABLE 4
Results of Regression Analysis for Parallel Regression Lines Fit to Data Points
intervention modality is particularly relevant for Taiwanese schools due to the nature of existing educational service delivery systems in that country. Finally, development of more naturalistic interventions for children with autism that fit within general education classrooms should be explored.

Promotion of social-emotional skill development for children with autism is important. Although numerous studies exist on social-emotional skill development it is critical that future research continue to expand and explore intervention curriculums and training modalities to further develop more effective and appropriate interventions.

References


