

Recognizing Non-Verbal Social Cues Promotes Social Performance in LD Adolescents

Dr. Alicia Greenbank¹ and Dr. Assia Sharon²

¹ Givat Washington College of Education and The Academic College of Israel in Ramat-Gan

² Levinsky College of Education and The Academic College at Wingate

The research examined whether an educational intervention could enhance the ability of learning disabled (LD) adolescents to recognize non-verbal emotional messages and thus their social functioning. Most LD children have problems recognizing non-verbal cues, particularly emotional ones, and have social difficulties. The study examined the validity of the theory of a link between ability to recognize non-verbal emotional cues and social functioning. According to this theory, the better the ability to recognize non-verbal emotional messages the better the social functioning. An educational intervention was devised to investigate this. The intervention included 12 lessons of 45 minutes each, twice a week for six weeks.

The study examined 77 Israeli LD, native Hebrew-speaking adolescents in grades 7-10. The results demonstrated the efficacy of the intervention in enhancing students' ability to recognize non-verbal emotional messages. Students' social functioning improved in two social parameters: empathy and social closeness. Students with borderline IQ benefited more from the intervention than students with normal range IQ, and boys benefited more than girls. The study suggests an effective practical tool for promoting social functioning among adolescents with LD.

Cette recherche a examiné dans quelle mesure une intervention éducative pouvait augmenter la capacité des adolescents ayant des problèmes d'apprentissage à détecter les messages émotionnels non verbaux et ainsi améliorer leurs comportements sociaux. La plupart des adolescents ayant des problèmes d'apprentissage éprouvent de la difficulté à reconnaître les messages non verbaux, notamment ceux de nature émotionnelle, et ils manifestent des difficultés sociales. Cette étude a examiné la validité de la théorie selon laquelle il y aurait un lien entre la capacité à détecter les messages émotionnels non verbaux et le fonctionnement sur le plan social. La théorie soutient que mieux on reconnaît les messages émotionnels non verbaux, mieux on fonctionne sur le plan social. Pour étudier cette théorie, nous avons conçu une intervention éducative impliquant 12 leçons de 45 minutes chacune, deux fois par semaine pendant six semaines.

Cette étude a porté sur 77 adolescents israéliens de langue maternelle hébraïque entre la 7^e et la 10^e année et ayant des difficultés d'apprentissage. Les résultats démontrent l'efficacité de l'intervention dans l'augmentation de la capacité des élèves de reconnaître les messages émotionnels non verbaux. Le fonctionnement social des élèves s'est amélioré selon deux paramètres sociaux: l'empathie et la proximité sociale. Les élèves ayant un QI limite ont profité plus de l'intervention que ceux ayant un QI dans la gamme normale, et les garçons ont démontré plus d'amélioration que les filles. Cette recherche propose un outil pratique et efficace

visant la promotion du fonctionnement social chez les adolescents ayant des difficultés d'apprentissage.

Social Difficulties of People with LD

Learning disability is defined as significant difficulty in acquiring and applying learning skills (Riddick, 2010) which also affects the social sphere. As many as 75% of students with LD also have social problems (Kavale & Forness, 1996). LD can lead to negative interactions with others, difficulties grasping social situations, and problems understanding body language, facial expressions, and social codes. People with LD are less socially adaptive, suffer more from rejection by their peers, and are prone to higher levels of anxiety, loneliness, and depression. These difficulties persist throughout a person's lifetime (Agalotis & Kalyva, 2008; Boo & Prins, 2007; Riddick, 2010).

It is unclear why people with LD experience social difficulties. The two leading theories are the Primary Factor Hypothesis and the Secondary Cause Hypothesis. According to the Primary Factor Hypothesis, social difficulties are the result of CNS (central nervous system) impairment, which reduces the individual's ability to absorb and process social cues. In contrast, with the Secondary Cause Hypothesis, social difficulties are a consequence of emotional difficulties and academic failure. In this case, students experience problems with the demands of school as well as failure and negative feedback, and may show anxiety, insecurity, and instability. Efforts to cope with these emotions give rise to non-adaptive behavior, low social status, and social rejection (Cook & Oliver, 2011; Elksnin & Elksnin, 2004).

A less popular hypothesis is the Social Learning Theory Hypothesis suggested by Gresham and Elliott (1989), based on Bandura's (1977) theory.¹ This hypothesis is highly relevant to our purposes and was useful in developing the educational intervention. Gresham and Elliott suggest that fear of failure prevents children with LD from participating in social activities. This reduces their opportunities to learn new social behaviors, practice requisite skills for normal social contact, and use these skills during social interactions. Lack of social experience makes it difficult to understand interpersonal communication, and can lead to social problems and negative reactions from others. Owing to their lack of positive reinforcement, LD children cannot overcome these social challenges. Gresham and Elliott maintain that social difficulty is the primary factor that needs to be treated. Accepting this argument, the present study developed and implemented an educational intervention that was designed to ameliorate the social difficulties of adolescents with LD by helping them recognize and interpret non-verbal emotional messages in different social situations.

The Importance of Non-verbal Components in Interpersonal Communication

According to Hargie (1997), individuals cope effectively with social interactions when they judge and respond to social situations correctly. This includes not only the ability to recognize what others say by relating to the verbal components of communication, but above all, to relate to *how* things are said; in other words, the non-verbal components of communication: facial expressions, gestures, posture, and intonation. Correspondingly, Mehrabian (1971) discloses that 90% of the message in interpersonal communication is non-verbal. These components are important since they add an emotional dimension to the verbal content of communication, and

enable people to understand what others around them feel and mean. When problems occur in childhood in terms of recognizing non-verbal messages and what other people feel, a lifetime of impaired social interaction can result (Cook & Oliver, 2011; Creusere, Alt, & Plante, 2004; Semrud-Clikeman & Schafer, 2000).

Many studies (e. g., Bauminger & Kimhi-Kind, 2008; Bauminger, Schorr-Edelsztein & Morash, 2005; Bloom, & Heath, 2010; Dimitrovsky, Spector, & Levy-Shiff, 2000; Meadan & Halle, 2004; Most & Greenbank, 2000) found that children with LD had problems recognizing messages involving non-verbal communication—especially non-verbal emotional messages—as well as problems absorbing, recognizing, processing, interpreting, and responding to non-verbal emotional messages. The children found it difficult to recognize different types of emotional messages presented in different ways: pictures of facial expressions and body posture, movies, stories, and tone of voice. Researchers found that the problems LD children experienced with regard to recognizing non-verbal messages, especially non-verbal messages relating to emotions, affected their social functioning. A study by Most and Greenbank (2000) found a positive correlation between the LD child's ability to recognize emotions and different social functioning skills.

Programs for Promoting the Social Functioning of LD Students

Many intervention programs have sought to promote social functioning among LD individuals. Most have proven unequal to the task of promoting social functioning among children and adolescents with LD (Elksnin & Elksnin, 2004; Kavale & Mostert, 2004; McIntosh, Vaughn, & Zaragoza, 1991; Schneider, 1992; Vaughn, McIntosh, & Hogen, 1990). Just over thirty years ago, Minskof (1980) and Straub and Roberts (1983) recommended that interventions to promote social functioning should aim to enhance the ability to recognize and understand non-verbal messages. A review of the interventions which were designed to enhance LD individuals' understanding of non-verbal emotional messages revealed that they all led to improvement. However the samples have been very small (generally less than ten), and most participants have been adults. Furthermore the impact on social functioning was never studied, apart from one intervention, which examined just six adults (Wood & Kroese, 2007).

The present study investigated a new intervention program, which was implemented with a group of seventy-seven adolescents with LD. The intervention is based on Minskof's program and Straub and Roberts' study, and accordingly focuses on the link between recognizing emotional messages and social functioning in people with LD. The underlying assumption is that it is possible to promote the social functioning of LD adolescents by improving their ability to recognize non-verbal emotional messages (Greenbank, 2004).

Research Hypotheses

1. Adolescents with learning disabilities who participate in the intervention will be better able to perceive non-verbal emotional messages (facial expression, body language, and intonation) than adolescents with learning disabilities who do not participate in the intervention.
2. The social functioning of adolescents with learning disabilities who participate in the intervention will be improved and they will show less aggression and withdrawal of social behaviors compared to adolescents in the control group. This improvement will be evident in

a number of measures of social functioning: assertiveness, cooperation, self-control, empathy, and social closeness.

We also examined the intervention's differential effect on the ability of diverse populations to recognize non-verbal emotions: girls versus boys and those of different IQ levels: borderline versus normal IQ.

Method

Participants

The research sample consisted of 77 native Hebrew-speaking Israeli students with LD studying in grades 7-10. The students came from special schools for children with LD. 39 students had an IQ of 80-70 and were classed as having a borderline-normal IQ and 38 students had an IQ of 80+ and were classed as having a normal IQ. The students were randomly assigned to an experimental group and a control group. The χ^2 analysis and t-test indicated no significant differences between the two groups for personal characteristics, perception of non-verbal messages involving emotion, and social functioning. In each of the study groups, two-thirds of the participants were boys and one-third were girls. The results showed a slight difference between the two groups. The χ^2 analysis to examine the gender-related differences between the students found no statistically significant differences between the groups: $p > .05$ $\chi^2 = .03$. The students' ages ranged from 12-17 years ($M = 15.21$, $SD = 1.24$).

Measurement Tools and Data Analysis

Tools for examining the identification of non-verbal emotional messages.

Test of emotion identification with reference to facial expressions and sound (IET). The IET (Identification of Emotions Test) was constructed in Hebrew and used previously with other populations (see Most, Weisel, & Zaychik, 1993). The test was designed to investigate the ability to recognize emotions using non-verbal visual cues (facial expressions) and auditory cues (non-verbal voice elements.) The IET included six presentations each of six emotions: joy, anger, fear, sadness, disgust, and surprise, for a total of 36 items presented in random order. The 36 items consisted of a video recording of a male actor who repeated a sentence six times ("I am going out now and I will be back later"), each time portraying a different emotion. The students were asked to indicate on a forced-choice answer sheet which one of the six emotions the actor was conveying in each presentation. The test generated seven indexes: one general index and six indexes relating to the six different emotions. An internal consistency analysis showed a high degree of consistency of $\alpha = 0.92$ for the total score. The internal consistency analysis conducted for each emotion produced an internal consistency of $\alpha = 0.68$ to $\alpha = 0.81$.

Test of emotion identification with reference to body language. The aim of the test of emotion recognition based on body language (Spence, 1985) was to investigate the participants' ability to recognize non-verbal emotional messages by looking at ten pictures of a woman presenting various emotions using body language in the following situations: concentrating-wonder-pondering deeply; happy-enthusiastic-excited; confident-showing off; suspicious-sneaky; warmly welcoming-friendly; sad-depressed; angry-indignant; indifferent-compromising-yielding; spurning-not wanting; and embarrassed. The test's reliability

coefficient was $\alpha = 0.75$. The test produced one index calculated from the number of correct answers. The score range was 0 to 10, such that the higher the score, the better the emotion identification. Pearson's correlation was used to measure the relation between the "identification of emotions using facial expression" index and the "identification of emotions using body language" index, and a high degree of correlation was found: $r = .70, p < .001$.

Tools for investigating social functioning. Three questionnaires were used to investigate social functioning. The first two were compiled by Gresham and Elliott (1990) and translated into Hebrew by Margalit (1991). These were:

- *The Teacher Social Skills Rating Scale (T-SSRS)* The teachers were asked to use the T-SSRS questionnaire (Teacher Social Skills Rating Scale) to evaluate their students' social functioning, including skills and behavior difficulties in the classroom. Teachers rated their students' social skills and behavior on a three-point frequency dimension ranging from 2 (often true) to 1 (sometimes true) to 0 (never true). The social skills component of the scale contained three types of social skills of ten items each. The three types were: cooperation, assertiveness, and self-control (reliability coefficients were: 0.87, 0.82, and 0.92, respectively). The problem behavior scale was divided into two behavior types of six items each: "introversion" – loneliness, anxiety, and depression and "extroversion" – offensiveness and aggression (reliability coefficients of .76, and .91, respectively).
- *The Student Social Skills Rating Scale (SSRS-S)* The S-SSRS questionnaire (Student Social Skills Rating Scale) was used to assess the students' subjective perceptions of their social skills. The questionnaire is a self-report in which students rated their own social behavior on a three-point frequency dimension ranging from 2 (often true) to 1 (sometimes true) to 0 (never true). In the present study, only the "Empathy" category in the original questionnaire was utilized since the reliability of the remaining three categories was low. The "Empathy" category consisted of nine items (reliability coefficient of $\alpha = 0.75$).

Student questionnaire for examining social closeness. The purpose of the questionnaire was to determine the adolescent's self-assessment of social closeness to other students. The questionnaire was specifically constructed for this study based on the one used by Teumi (1990) in her research. The questionnaire investigates the willingness of the respondents to be close to and to engage in activities with four types of students who were presented in four stories. The types of students differed in two dimensions: (a) "Functioning as a Student" (investment in studies, wish to succeed academically, and behavior in class and school), and (b) "Social Acceptability" (social connections and popularity with other students). The four student types were: (a) a student who functions well as a student and is socially acceptable; (b) a student who functions poorly as a student and is socially acceptable; (c) a student who functions well as a student and is not socially acceptable, and (d) a student who performs poorly as a student and is not socially acceptable. The stories were adapted to the respondents' ages and genders. The questionnaire consisted of five questions regarding the respondent's interest in being close socially with each of the student types, on a scale from 1 (never) to 6 (very much). Internal consistency was found to be high for all four story types ($\alpha = 0.87$ in the first story; $\alpha = 0.88$ in the second story; $\alpha = 0.83$ in the third story, and $\alpha = 0.89$ in the fourth story). For each story, a score was calculated based on the total for the five items, and a score was obtained that ranged from 5-25, such that the higher the score the greater the student's interest in social closeness.

Research Design

Two special schools for students with learning disabilities were chosen for the study. Participants consisted of 77 students studying in grades 7-10. The students were randomly assigned to experimental classes and control classes (containing 43 and 34 students, respectively). All of the children in the experimental classes participated in the intervention, since this was the best way to teach social behavior and make social behavior a part of the classroom dynamic (Gresham, 1998).

Tools were also administered prior to the intervention to all students in the experimental and control classes in order to examine their recognition of non-verbal emotional messages. Tools for investigating social functioning were administered to teachers (T-SSRS) and students (S-SSRS). The same tools were administered after the intervention. Students also completed a social closeness questionnaire.

In addition, the school's educational counselor and school psychologist provided information about the participants' IQ. Once the questionnaires were administered, those homeroom teachers whose classes were participating as the experimental group received details of the intervention. The intervention was comprised of 12 lessons of 45 minutes each. Classes were held twice a week for six weeks, as suggested by Wiener and Harris (1997), who found six weeks the most effective time frame for achieving success with this type of intervention. Schneider (1992) recommended employing an experienced group facilitator for interventions. The intervention occurring in this study was therefore taught by an educational counselor specializing in group instruction. Homeroom teachers were present during the group instruction.

The following principles applied to the intervention:

Adolescence is a Critical Period for Social Skills Training and Intervention.

Because of the LD students' social difficulties, interventions should be introduced while young. However, it is very important that an intervention would also take place during adolescence. Social skills training during this developmental period can profoundly impact and positively influence adolescent behavior (Kolb & Hanley-Maxwell, 2003). Training facilitates social interactions like group discussion and classroom activity, encouraging new behavior patterns. This is important at this age as it helps lower frustration, loneliness, and depression, and enables adolescents with LD to avoid negative behaviors such as delinquency or school drop-out problems, which tend to typify LD adolescents (Al-Yagon, 2012; McNamara, Vervaeke & Willoughby, 2008).

Promoting Social Behavior Through Appropriate Social Skills. According to social learning theory, social functioning can be improved by helping individuals to acquire social skills and allowing them to experiment with situations involving social communication (Gresham & Elliot, 1989). In the present intervention, participating students were given the chance to learn a variety of techniques that could help them recognize and interpret non-verbal messages with emotional content, and assist them in applying their skills to social situations, thereby improving their social behavior. The present intervention utilized three approaches which, according to Gresham (1998), are central to promoting social behaviors. These approaches are: (a) modeling, (b) coaching, and (c) behavioral rehearsal.

The task of recognizing and understanding non-verbal messages must be linked to social situations. Throughout the intervention, students were presented with opportunities to recognize emotional messages in social situations. They watched and experimented with

social interactions which required them to recognize communications involving emotions, and to respond to them in a situation-appropriate way. Their social response was evaluated and they received feedback from friends and the intervention instructor. The purpose of the evaluation and feedback concerning their social behavior was to help students improve their social performance (Straub & Roberts, 1983.)

The pedagogical hierarchy principle. The intervention followed the pedagogical hierarchy principle: start with the easiest aspect of the intervention from the pedagogical standpoint and progress to the most challenging:

1. Following Minskof's (1980) suggestion, the program involved four stages, each stage built on the knowledge gained in the preceding stage (see Research Design section).
2. Following Straub and Roberts' (1983) recommendations, this intervention taught students first to recognize basic, easily-identified emotions such as joy, sadness, fear, anger, surprise, and disgust, and then more difficult emotions, such as pride, disappointment, and loneliness.

The program opened with an introductory lesson about the project. Different activities were taught in the lessons and the best techniques for teaching social behaviors were used. These techniques were: modeling, coaching, and behavioral rehearsal (Gresham, 1998). The intervention was divided into four stages according to Minskof (1980):

Step I (about three lessons). The aim of this step is to train students to identify emotional messages, and to direct the student's attention to critical auditory and visual social cues by isolating and accentuating these cues.

The students learned to "read" non-verbal emotional communications, for example, how to: visually recognize emotional body language and facial expressions; recognize emotional intonation; discriminate and imitate facial expressions, body language, and intonation; and notice the vocal sounds, body posture, etc., that people used to show emotion. This stage was mainly focused on modeling-based learning.

Step II (about three lessons). The goal of this step is to help students understand the connection between non-verbal emotional communications and social situations.

Students were taught to identify the relation between emotions and their social context. The main training medium for this stage was coaching.

Step III (about two to three lessons). This step's purpose is to train students to express non-verbal emotional communication in response to social situations.

In addition to involving students in role play, this step required students to present their personal stories of experiencing the emotion studied. This stage involved mainly behavioral rehearsal.

Step IV (about three or four lessons). In this step, the intention is to help students apply what they learned from the first three steps. In this step, the intervention tested their ability to correctly recognize and respond to non-verbal emotional communication in real-time communication interactions. This involved recognizing a non-verbal emotional communication, linking it to a social situation, and deriving conclusions. The students were also presented with different social situations and asked to examine which emotion they were expressing. This stage involved all three learning methods, namely: modeling, coaching, and behavioral rehearsal.

Steps were taken to ensure that the intervention classes were conducted as planned and that all students in the experimental group were present.

While the experimental group was engaged in the intervention program, the control group

went about its normal classroom curriculum. Following the conclusion of the intervention, the same questionnaires as the ones the participants completed before the intervention were administered to them. Additionally, the students completed a questionnaire investigating their willingness to accept social closeness.

Results

To examine differences in the research groups, MANOVA analyses were conducted to compare means in which the number of dependent variables was greater than 1. The analysis results are presented below for the two hypotheses: perception of non-verbal emotional messages and social functioning.

Recognition of Non-Verbal Emotional Communication

We used two measures of the "emotional messages" variable: (a) Facial expressions and voice elements, and (b) body language. These measures are expressed as percentages: the percentage of emotions correctly identified from the emotions the students were shown. The students' pre- and post-intervention questionnaire responses were used to calculate the measures. The aim was to reveal differences in non-verbal emotional messages recognition between students who participated in the intervention (experimental group) and students who did not (control).²

A 2 x 2 MANOVA analysis of Group x Time which was conducted showed significant differences between the measurements before and after intervention ($F(2,74) = 28.31, p < .001, \text{Eta}^2 = .43$), along with a significant Group-Time interaction ($F(2,74) = 33.54, p < .001, \text{Eta}^2 = .48$). Table 1 presents the means and standard deviations for the two research groups and the results of the analyses carried out for the various indexes.

As we see from Table 1, significant differences are found between the pre- and post-

Table 1

Pre- and Post-Intervention Measures of Non-verbal Emotional Communication in the Two Research Groups (Means and SDs)

Measures	Groups	Experimental (n=43)		Control (n=34)		F	Eta2	F	Eta2
		Before	After	Before	After				
Recognition of Facial Expression	M	64.37	83.42	56.64	56.17	56.93***	.43	62.89***	.46
	SD	14.15	7.98	15.40	16.02				
Recognition of Body Language	M	69.30	84.19	61.77	58.82	10.70**	.13	23.84***	.26
	SD	19.07	12.77	21.81	19/64				

p < .01 *p < .001

intervention results for the indexes “Recognizing Facial Expressions” and “Recognizing Body Language.” Table 1 shows that for the experimental alone, the means obtained from the second measurement of the two indexes were significantly higher than the means obtained from the first measurement. A significant Group x Time interaction was thus apparent for both measures. The simple effects analysis that was carried out to examine the change in the two groups demonstrated a significant difference in perceived non-verbal emotional communication via facial expressions ($t = 11.25, p < .001$) and perceived non-verbal emotional communication via body language ($t = 6.01, p < .001$), for the experimental group alone. With regard to the control group, there was a non-significant difference in the perceived non-verbal emotional communication using facial expressions ($t = 0.27, p > .05$) and the perceived non-verbal emotional communication using body language ($t = 1.11, p > .05$). This supports the research hypothesis that the intervention would enhance student perceptions of non-verbal emotional communications.

Social Functioning

The methods below were used to examine social functioning:

- Teacher evaluation of student social skills.
- Student self-reporting regarding empathy and social closeness towards characters presented to them.

A MANOVA analysis compares the research groups' performance in these parameters.

The findings for the areas examined are shown below.

Social skills. Three social measures: assertiveness, cooperation, and self-control, and two behavioral measures: withdrawal and aggression were used to examine social skills pre- and post-intervention.

A 2 x 2 MANOVA Group x Time test with repeated measurements over time was conducted and no significant Group x Time interaction was found ($F(5,71) = .26, p > .05$). In other words, according to the teachers' assessment, the social skills of the experimental group and the control group were similar, which was contrary to expectations.

Empathy. Empathy was examined using a student self-evaluation tool. The scores are presented below as a percentage of respondent's answers out of the possible total for all sub-areas.

The first step was to establish any pre-intervention differences between the two groups. As noted, analysis of variance revealed no differences between the groups ($F(1,75) = .27, p > .05$). Thus, the two groups had the same level of empathy prior to intervention.

As observed previously, the research hypothesis is concerned with post-intervention differences in empathy between the two groups. The 2 x 2 MANOVA (Group x Time) with repeated measurements over time found no difference between the first measure and second measure for both groups ($F(1,75) = 2.98, p > .05$). However, a significant interaction between Group x Time was found: $F(1,75) = 23.22, p < .001, \eta^2 = .24$.

The figure shows a large improvement in empathy for the experimental group and a small decline in empathy for the control group. The findings support the hypothesis that the intervention would help increase empathy.

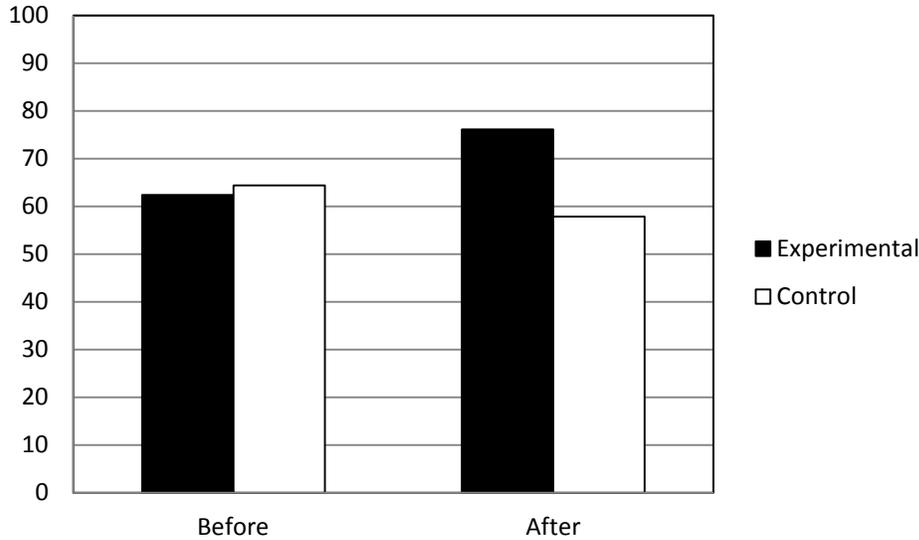


Figure 1. Measures of empathy (means) pre- and post-intervention (Experimental: n=43) (Control: n=34)

Social closeness. As noted above, social closeness was measured on the basis of students’ responses to four student types, which appeared in stories and were described in terms of two dimensions: “Functioning as a Student” and “Social Acceptability.” A 2 x 2 x 2 analysis of variance (Group x Performance as a Student x Social Acceptability) was conducted, and revealed that the willingness of the experimental group to be socially close to others was significantly higher than that of the control group for all student types that appeared in the questionnaire ($F(1,75) = 13.31, p < .001, \text{Eta}^2 = .15$) ($M = 19.29, SD = 3.46; M = 16.41, SD = 3.41$ respectively).

The MANOVA also pointed to a significant difference in feelings of social closeness towards characters who performed appropriately as students versus characters who performed inappropriately as students ($F(1,75) = 184.45, p < .001, \text{Eta}^2 = .71$). A significant interaction was also found for Group x Performance as a Student ($F(1,75) = 3.95, p < .05, \text{Eta}^2 = .05$).

Figure 3 presents the means for this variable for both research groups.

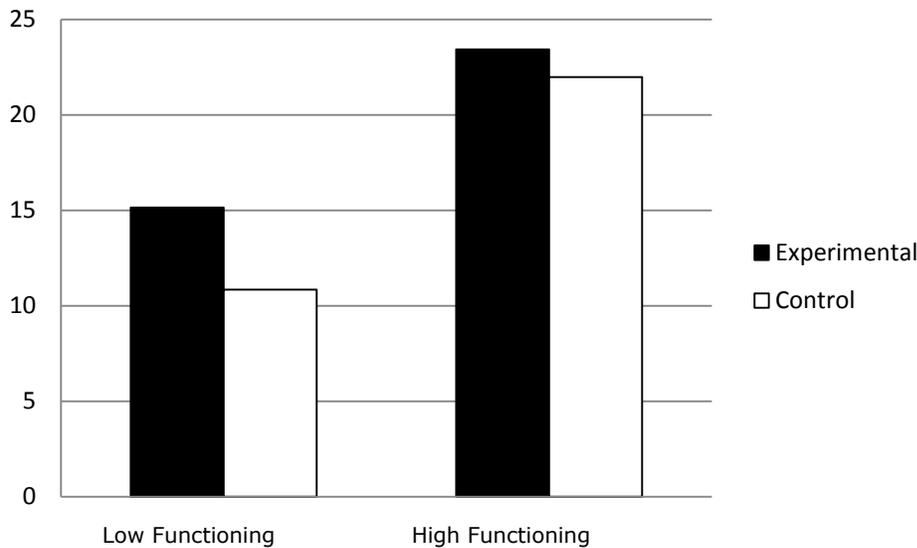


Figure 2. Social Closeness (means) Low- and High-Functioning Students (Experimental: $n=43$) (Control: $n=34$)

As we can see from Figure 2, the subjects in the two research groups felt socially closer to student types that were high-functioning academically and behaviorally than to low-functioning student types in those areas. However, the gap between the two groups was greater for the low-functioning types (experimental group 15.5, control group 10.85) than for the high-functioning types (23.43 and 21.97, respectively). The same result emerged from the simple effects analysis which compared the two groups' attitudes to the different student types. A significant difference was found between the groups ($t(75) = 3.92, p < .001$) for low-functioning student types though not for high-functioning student types ($t(75) = 1.42, p > .05$).

Regarding the socially acceptable type, no significant interaction was found for Group X Social Acceptability ($F(1,75) = .10, p > .05$). In other words, the results demonstrated that the subjects in both research groups had the same attitudes toward social acceptability. Both groups of subjects were thus found more willing to be close socially to socially acceptable types of student than to non-socially acceptable types.

Individual Characteristics

IQ. The research investigated the relation between the research indexes and levels of IQ (borderline IQ and normal IQ). Separate ANOVAs were performed for each index and showed a significant interaction between the indexes: Recognizing Facial Expressions ($F(1,73) = 4.15, p < .05, \text{Eta}^2 = .05$) and Recognizing Body Language ($F(1,73) = 4.28, p < .05, \text{Eta}^2 = .06$), see Figures 4 and 5.

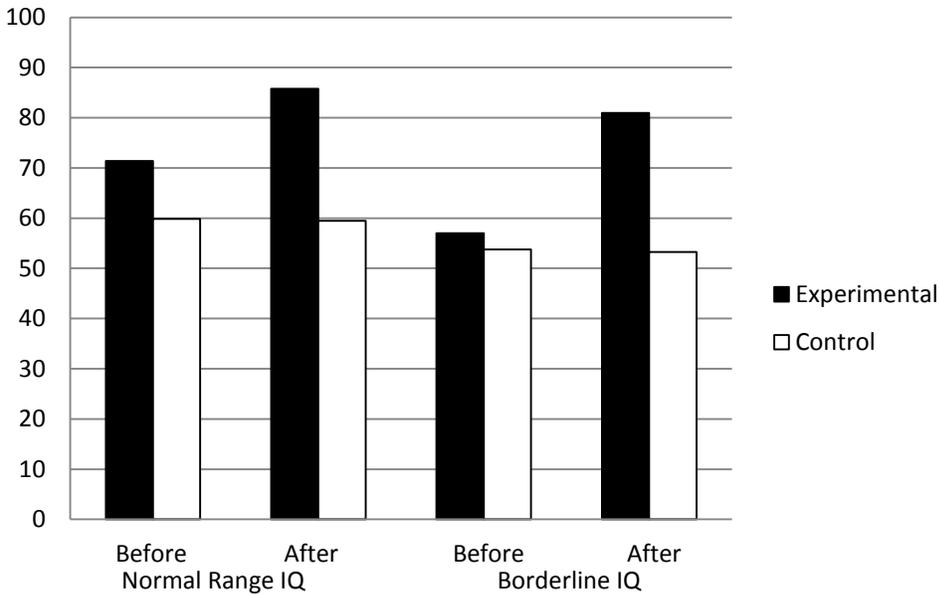


Figure 3. Recognition of Facial Expression: IQ Differences (means) pre- and post-intervention (Experimental: n=43) (Control: n=34)

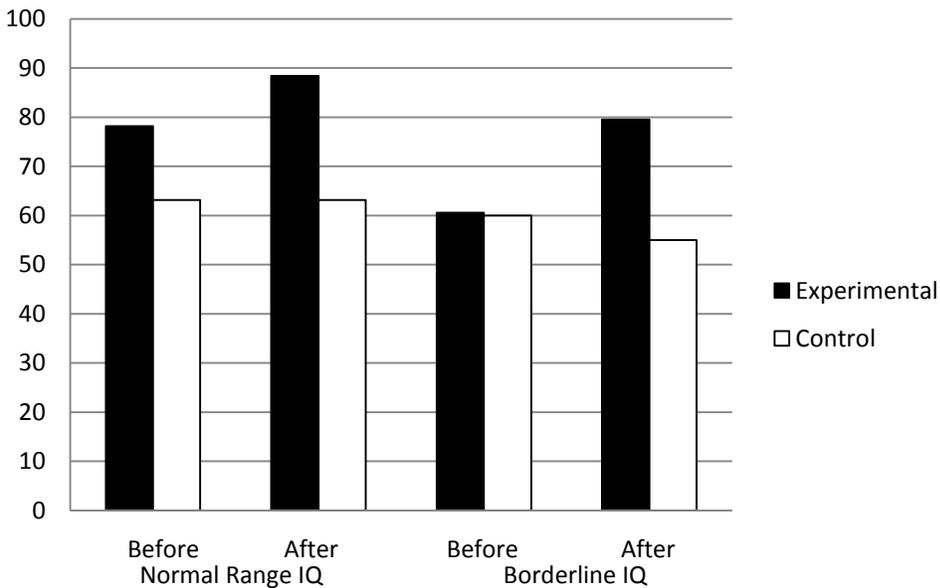


Figure 4. Recognition of Body Language: IQ Differences (means) pre- and post-intervention (Experimental: n=43) (Control: n=34)

It is apparent from Figures 3 and 4 that borderline IQ students showed more improvement in recognizing emotions based on facial expressions and body language than students with normal IQs. Simple Effects Analysis of facial expression recognition for the experimental group showed a higher degree of improvement among subjects with a borderline IQ ($F(1, 20) = 98.60, p < .001, \eta^2 = .83$) than students with a normal IQ ($F(1, 21) = 54.76, p < .001, \eta^2 = .72$).

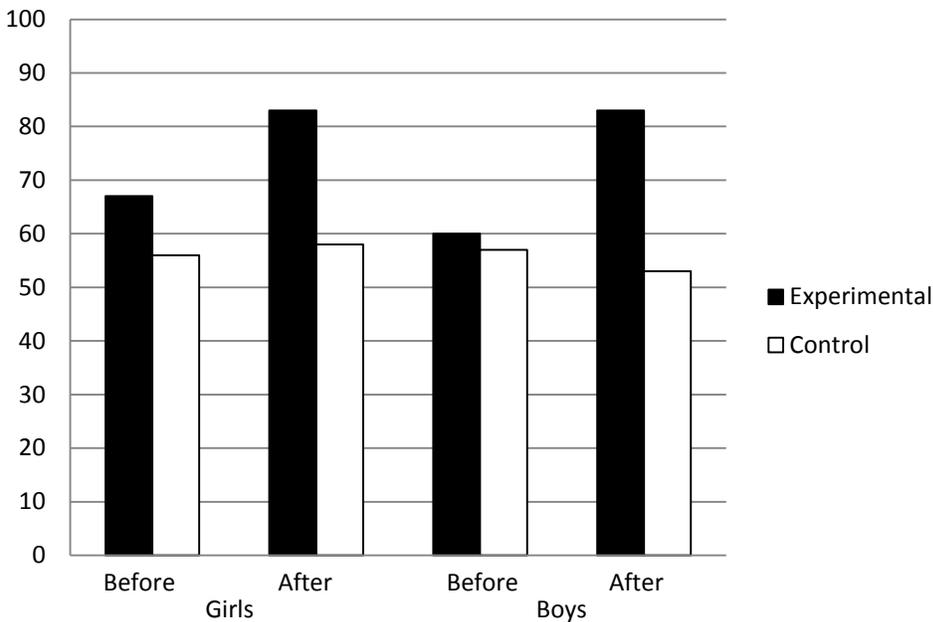


Figure 5. Recognition of Facial Expression: Gender Differences (means) pre- and post-intervention (Experimental: n=43) (Control: n=34)

Similar findings were obtained with regard to body language recognition. In the experimental group, subjects with a borderline IQ ($F(1, 20) = 21.44, p < .001, \text{Eta}^2 = .52$) showed a higher degree of improvement than subjects with a normal IQ ($F(1, 21) = 18.75, p < .001, \text{Eta}^2 = .47$).

Gender. In order to establish whether the intervention affected boys and girls in a similar way, a MANOVA $2 \times 2 \times 2$ analysis was performed (Groups \times Gender \times Time). The analysis showed no statistically significant interaction between gender and time, $F(8, 66) = 1.39, p > .05$ or Group \times Gender \times Time, $F(8, 66) = 1.37, p > .05$. However, when analyses of variance was carried out for each index separately, a significant interaction was found for identifying facial expressions: $F(1, 73) = 6.13, p < .05, \text{Eta}^2 = .08$ (see Figure 5).

Figure 5 demonstrates an improvement in the experimental group's ability to recognize emotions from facial expressions compared with the control group. The degree of improvement was higher for boys than girls. The results for the control group boys even showed a slight deterioration in the second measurement. Although the simple effects analysis to compare the boys and girls separately for both the experimental group and control group showed a significant variance between these groups, the difference for the boys $F(1, 27) = 49.45, p < .001, \text{Eta}^2 = .65$ was much greater than for the girls $F(1, 46) = 23.94, p < .001, \text{Eta}^2 = .36$.

Discussion

The main research goal of this study was to examine the theory that there is a link between perception and recognition of non-verbal emotional communication (facial expressions, vocal elements, body language) and social functioning among adolescents with LD. This was achieved by developing an educational intervention aimed at improving the ability of LD adolescents to recognize and interpret non-verbal emotional communications. It was hypothesized that if the

intervention managed to enhance the students' ability to perceive non-verbal emotional communication and improve their social functioning it would substantiate the theory and help us improve LD students' social functioning both in and out of school.

Intervention Program Impact on Perceptions of Non-Verbal Communication of Emotion

According to the study findings, the intervention improved the LD adolescents' ability to recognize non-verbal emotional communication. This supports the results in Wood and Kroese's (2007) review of the literature describing the efficacy of interventions for enhancing emotional recognition skills in people with LD. The current research is novel in terms of its sample size, since it is far larger than previous studies, as well as it having a rigorous approach used for planning and executing the intervention.

It seems to be very important how the intervention program is constructed. The present intervention's construction followed the conclusions of other researchers regarding the factors that impact intervention efficacy (McIntosh et al., 1991; Schneider, 1992; Vaughn et al., 1990). Thus we paid attention to the selection of the groups and their size, students' ages, intervention length, choice of who ran the intervention, and operating methods. The intervention itself was modeled on the recommendation of Straub and Roberts (1983) and Minskof (1980), and accordingly, was introduced in stages while using different methodologies.

Effect of the Intervention on Social Functioning

The study found a significant correlation between the change in the students' ability to recognize emotional communications before and after the program, and the measures of empathy and social closeness. Thus, the research hypothesis that the LD adolescents' non-verbal emotional communication skills would improve and that their social functioning would subsequently improve was partially corroborated by this study.

The only indexes tested by student self-reporting were Empathy and Social Closeness. This meant that the students themselves reported on the changes they experienced following the intervention.

However, the teachers' evaluation of students' social functioning employed a questionnaire with different social measures (cooperation, self-control, assertiveness, aggression, and withdrawal) from the student questionnaire. The teachers' reports indicated that intervention did not improve these factors. The changes in social functioning according to the teachers' reports and students' reports were different because the teacher and student questionnaires did not examine the same social measures.

It can also be assumed that even though the students felt a change had occurred, that change was not yet apparent in their overt social behavior. Therefore the teachers had not noticed the change. In other words, even if these aspects of their behavior had improved, a different measurement may be necessary to recognize them.

The two indexes that showed improvement—Empathy and Social Closeness—are linked more closely to emotional recognition than the other social functioning indicators that were tested. This is because social closeness is a basic social skill and a foundation for the other social skills. On the other hand, empathy involves understanding others and involves identifying with their feelings. It is a skill which contributes to the individual's social and communication

development.

Empathy is an indicator of the ability to understand others' needs, show concern, and anticipate the feelings, thoughts, and behaviors of others. An empathic person uses his or her ability to establish positive and effective communication with the world (Reed, 1984). Empathy is therefore linked to recognizing emotions, as it involves understanding others and connecting with their emotions, as Most and Greenbank (2000) reported in their study.

As for social closeness, this relates to an individual's willingness to approach others and engage in activities with them. As noted before, this was tested by asking students to complete a questionnaire after the intervention, requiring them to show how willing they would be to engage in contact with the student characters in the stories they were asked to read. The findings showed that only the intervention students were more willing to countenance social closeness after their ability to recognize emotions had improved.

Unlike empathy and social closeness, which are linked to emotion recognition, cooperation, self-control, assertiveness, aggression, and withdrawal are essentially different from recognizing emotions, and some require different skills such as self control which requires the individual to be conscious of his or her behavior and its impact on others in addition to being able to recognize emotions. To improve self-control skills, the person must regulate behavior, moderate impulsiveness, and manage anger. Thus, improving an individual's ability to recognize emotions does not suffice to affect these skills.

An examination of the two social closeness dimensions—Functioning as a Student (investment in studies, wish to succeed academically, and behavior in class and school) and Social Acceptability (social connections and popularity with other students)—revealed that both the experimental group and the control group showed more willingness to engage in social closeness with the successful student figures in the stories. This result was expected, since people are generally drawn towards successful types. A more important finding was that students who received the intervention and enjoyed satisfying social experiences became more willing to consider social closeness with other academically, behaviorally, and socially low functioning students. This seems to indicate that these students learned to weigh one another's qualities, recognize differences in others, and react sensitively and responsively to their peers' needs. It seems that what they learned had helped them accept students who functioned poorly academically, behaviorally, and socially, and had increased their willingness to be close to them socially.

IQ

Pre-intervention tests showed that students with a normal range IQ were better at recognizing emotions than students with a borderline IQ. This is consistent with the findings of previous studies showing a link between recognizing emotions and IQ such that the higher the person's IQ the better they are at recognizing emotions (Rojahn, Rabold, & Schneider, 1995; Simon, Rosen, Grossman, & Pratoski, 1995). The same applies to individuals with LD (Sams, Collins, & Reynolds, 2006). The present findings also show a link between the intervention and IQ—the students with a borderline IQ gained more from the intervention than students with a normal-range IQ. We can explain this by the fact that students with borderline IQ require intensive coaching and a clear, concrete teaching method which resembles the method used with the current intervention.

Gender

The pre-intervention measurement showed no gender-related differences for emotion recognition. Researchers of LD populations generally ascribe this to changes in gender related social values associated with emotions. In the past, women were better at recognizing emotions than men. Nowadays, because it is more legitimate for men to express their emotions, gender differences relating to the recognition and expression of emotions are blurred. Therefore, today we do not necessarily expect to find gender differences in the ability to recognize others' emotions (Dimitrovsky et al., 2000; Most & Greenbank, 2000).

The post-intervention measurements show that the boys responded differently to the intervention than the girls: the boys' ability to recognize emotions improved more than the girls'. Semrud-Clikeman and Schafer (2000) found that children with adaptive social behavior recognize facial expressions better than children with social behavior problems. In her study of LD adolescents, Tur-Kaspa (2002) found that the social functioning of girls was better than that of boys. She suggested that this is because adolescent girls ascribe more importance to social interactions than boys. One would therefore expect that the girls' recognition of emotions in the present study would outstrip that of the boys. However, as we saw, no gender differences were found in the students' ability to recognize emotions prior to the intervention, although it appears that the intervention helped boys to recognize emotions more than girls. In order to explain this finding, future research should focus on gender-based differences in recognizing emotions.

Conclusions, Limitations and Recommendations

The main finding of this study is that we can improve the ability of adolescent students with LD to recognize emotions and improve aspects of their social functioning if an intervention is used that focuses on perceiving non-verbal emotional messages. This conclusion has practical implications for applied pedagogy as well; the intervention can be employed by the education system. The program is structured and simple to use in the school and classroom framework. It is designed for groups of students and can be incorporated into the curriculum at minimal cost. With appropriate training, the contents can be taught by teachers and school counselors. An important contribution of this practical educational-pedagogical program is that it can be used in special education settings. This is very important, given the disagreement among researchers regarding the effectiveness of intervention programs in these frameworks (McIntosh et al., 1991; Vaughn et al., 1990; Wiener & Harris, 1997).

Various limitations should be considered in any attempt to generalize the findings of this study. These can be addressed by future research.

1. The present intervention lasted six weeks as this was the time frame that other studies found to be effective (Wiener & Harris, 1997). Future research could conduct the intervention over longer a longer period, for example during the whole school year, and then study its effects. Similarly, it would be interesting to conduct a follow-up study to examine the long-term impact of the intervention.
2. We did not divide the students into LD subgroups, such as verbal versus nonverbal learning disabilities, students with dyslexia versus dyscalculia, and so on. Therefore we recommend researching the efficacy of the intervention for different subgroups of LD students.
3. The study examined LD adolescents in grades 7-10. Future research would do well to focus

on younger children with LD.

4. The research took place in special education settings. Future research should examine inclusive settings as well.
5. Finally, the present study used questionnaires to measure social functioning. It would be valuable for future research on the intervention's impact on social functioning to use other measurement tools. The ideal tools would provide a broader, more comprehensive picture of students' social functioning before and after intervention (for example, observations, interviews with participants, interviews with students and teachers regarding students' social functioning). A combination of tools would help us understand why teachers and students have different views concerning students' social functioning. We could then learn more about social indicator constituents and the relation between LD students' ability to recognize emotions and social functioning.
6. It was encouraging to find that borderline IQ students can significantly improve their capacity to recognize emotions. Exploring how interventions can help students with other IQ scores, would also be worthwhile.

References

- Agaliotis, I., & Kalyva, E. (2008). Non-verbal social interaction skills of children with learning disabilities. *Research in Developmental Disabilities, 29*(1), 1-10.
- Al-Yagon, M. (2012). Adolescents with learning disabilities: Socio-emotional and behavioral functioning and attachment relationships with fathers, mothers and teachers. *Journal of Youth Adolescence, 41*(10), 1294-1311. doi:10.1007/s10964-012-9767-6
- Bauminger, N., & Kimhi-Kind, I. (2008). Social information processing, security of attachment and emotion regulation in children with learning disabilities. *Journal of Learning Disabilities, 38*(1), 45-61.
- Bauminger, N., Schorr-Edelsztein, H., & Morash, J. (2005). Social information processing and emotional understanding in children with LD. *Journal of Learning Disabilities, 38*, 45-61.
- Bloom, E., & Heath, N. (2010). Recognition, expression and understanding facial expressions of emotion in adolescents with nonverbal and general learning disabilities. *Journal of Learning Disabilities, 43*(2), 180-192.
- Boo, G. M., & Prins, P. J. M. (2007). Social competence in children with ADHD: Possible moderators and mediators of social-skills training. *Clinical Psychology Review, 27*, 78-97.
- Cook, F., & Oliver, C. (2011). A review of defining and measuring sociability in children with intellectual disabilities. *Research in Developmental Disabilities, 32*, 11-24.
- Creusere, M., Alt, M., & Plante, E. (2004). Recognition of vocal and facial cues to affect in language-impaired and normally-developing preschoolers. *Journal of Communication Disorders, 37*, 5-20.
- Dimitrovsky, L., Spector, H., & Levy-Shiff, R. (2000). Stimulus gender and emotional difficulty level: their effect on recognition of facial expressions of affect in children with and without LD. *Journal of Learning Disabilities, 33*, 410-416.
- Elksnin, L., & Elksnin, N. (2004). The social-emotional side of learning disabilities. *Learning Disability Quarterly, 27*, 3-8.
- Greenbank, A. (2004). *Intervention program for promoting the recognition of non-verbal emotional messages and social performance among adolescents with learning disabilities*. (Doctoral dissertation). Bar Ilan University, Ramat Gan, Israel
- Gresham, F. M. (1998). Social skills training with children. In L. Watson & F. M. Gresham (Eds.),

- Handbook of child behavior therapy* (pp. 475-497). New York, NY: Plenum Press.
- Gresham, F. M., & Elliot, S. N. (1989). Social skills deficits as a primary learning disability. *Journal of Learning Disabilities, 22*, 120-124.
- Gresham, F. M., & Elliot, S. N. (1990). *Social skills rating system manual*. Circle Pines, MN: American Guidance Services.
- Hargie, O. (1997). Communication as skilled performance. In O. Hargie (Ed.), *The handbook of communication skills* (2nd ed., pp. 7-28. London, UK: Routledge.
- Kavale, K. A., & Forness, S. R. (1996). Social skill deficits and learning disabilities: A meta-analysis. *Journal of Learning Disabilities, 29*, 226-237.
- Kavale, K. A., & Mostert, M. P. (2004). Social skills interventions for individuals with learning disabilities. *Learning Disability Quarterly, 27*, 31-43.
- Kolb, S. H., & Hanley-Maxwell, C. (2003). Critical social skills for adolescents with high incidence disabilities: parental perspectives. *Council for Exceptional Children, 69*, 163-179.
- Margalit, M., Ankonina, D., & Al-Yagon, M. (1991). *I found a solution: Promoting social competence in special education students – final report*. Tel- Aviv, Israel: Machshava.
- McIntosh, R., Vaughn, S., & Zaragoza, N. (1991). A review of social interventions for students with learning disabilities. *Journal of Learning Disabilities, 24*, 451-458.
- McNamara, J., Vervaeke, S. L., & Willoughby, T. (2008). Learning disabilities and risk-taking behaviour in adolescents: A comparison of those with and without comorbid attention-deficit/ hyperactivity disorder. *Journal of Learning Disabilities, 41*, 561-574.
- Meadan, H., & Halle, J. W. (2004). Social perceptions of students with learning disabilities who differ in social status. *Learning Disabilities Research and Practice, 19*, 71-82.
- Mehrabian, A. (1971). *Silent messages*. Belmont, NJ: Wadsworth.
- Minskoff, E. H. (1980). Teaching approach for developing non-verbal communication skills in students with social perception deficits. *Journal of Learning Disabilities, 13*, 9-15, 34-39.
- Most, T., & Greenbank, A. (2000). Auditory, visual and auditory-visual perception of emotions by adolescents with and without learning disabilities and their relationship to social skills. *Learning Disabilities Research and Practice, 15*, 171-178.
- Most, T., Weisel, A., & Zaychik, A. (1993). Auditory, visual and auditory-visual identification of emotion by hearing and impaired adolescents. *British Journal of Audiology, 27*, 247-253.
- Reed, G. S. (1984). The antithetical meaning of the term "empathy" in psychoanalytic discourse. In L. J. Bornstein & D. Silver (Eds.), *Empathy* (Vol. 1, pp. 7-24). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Riddick, B. (2010). *Living with Dyslexia: The social and emotional consequences of specific learning difficulties/disabilities*. London, UK and New York, NY: Routledge Taylor & Francis.
- Rojahn, J., Rabold, D. E., & Schneider, F. (1995). Emotion specificity in mental retardation. *American Journal on Mental Retardation, 99*, 477-486.
- Sams, K., Collins, S., & Reynolds, S. (2006). Cognitive therapy abilities in people with learning disabilities. *Journal of Applied Research in Intellectual Disabilities, 19*, 25-33.
- Schneider, B. H. (1992). Didactic methods for enhancing children's peer relations: A quantitative review. *Clinical Psychology Review, 12*, 363-382.
- Semrud-Clikeman, M., & Schafer, V. (2000). Social and emotional competence in children with ADHD and/or learning disabilities. *Journal of Psychotherapy in Independent Practice, 1*, 3-19.
- Simon, E. W., Rosen, M., Grossman, E., & Pratoski, E. (1995). The relationships among facial emotion recognition, social skills, and quality of life. *Research in Developmental Disabilities, 16*, 383-391.
- Spence, S. (1985). *Social skills training with children and adolescents: A counsellor's manual*. Windsor, UK: NFER-Nelson.
- Straub, R. B., & Roberts, D. M. (1983). Effects of non-verbal oriented social awareness training program on social interaction ability of learning disabled children. *Journal of Non-verbal Behaviour, 7*, 195-201.

- Teumi, O. (1990). *The Link between self-attention and social acceptance in depressive individuals*. (Master's thesis). Bar Ilan University, Ramat Gan, Israel.
- Tur-Kaspa, H. (2002). The socioemotional adjustment of adolescents with LD in the kibbutz during high school transition periods. *Journal of Learning Disabilities, 35*, 87-96.
- Vaughn, S., McIntosh, R., & Hogen, A. (1990). Why social skills training doesn't work: An alternative model. In T. E. Scruggs & B. Y. L. Wong (Eds.), *Intervention research in learning disabilities* (pp. 279-303). New York, NY: Springer Verlag.
- Wiener, J., & Harris, P. J. (1997). Evaluation of an individualized, context-based social skills training program for children with learning disabilities. *Learning Disabilities Research and Practice, 12*, 40-53.
- Wood, P. M., & Kroese, B. S. (2007). Enhancing the emotional recognition skills of individuals with learning disabilities: A review of the literature. *Journal of Applied Research in Intellectual Disabilities, 20*, 576-579.

Notes

¹ Bandura's social learning theory stressed the importance of observational learning imitation and modeling. People observe other people's behavior, encode it, and at a later time they may imitate it.

² Note: when the two groups were examined prior to intervention no statistically significant differences were found $F(2,74) = 2.88, p > .05$.

Dr. Alicia Greenbank is a Lecturer of Special Education at Givat Washington College of Education and a Lecturer at the School Counseling academic program at the Academic College of Israel in Ramat-Gan. She was the head of MEITAR, a counseling and support center for LD students. Her interests include special education, school counseling, and didactic diagnosis. She focuses on social-emotional development, anti-social behavior and social skills training program intervention for children and adolescents with learning disabilities.

Dr. Assia Sharon is the founder and manager of Assif, a publication house and a facilitator of academic and creative writing in Israel. She is also a Lecturer and the head of the digital academic literacy team at Levinsky College of Education, and a Lecturer at the Academic College at Wingate. Academic fields: education, psychology, the Hebrew language, professional editing, expository writing, and philosophy. Assi.sharon@gmail.com