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Nonverbal social interaction skills of children with learning disabilities

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Abstract

Many children with learning disabilities (LD) face problems in their nonverbal communication, which constitutes an important component of their social skills. This study explores the frequency of nonverbal initiations and responses of 36 children with LD and 36 children without LD matched for age and gender, who were observed for 40 min during the break. Younger and older children with and without LD did not differ significantly in their nonverbal responses, but there was a statistically significant difference in terms of younger children's nonverbal initiations. Younger children with LD exhibited significantly fewer nonverbal initiations than younger children without LD. Findings are discussed and suggestions are made for further research. © 2006 Elsevier Ltd. All rights reserved.

Keywords: Learning disabilities; Nonverbal communication skills; Initiations; Responses; Social competence

The social skills of children with learning disabilities (LD) are compromised, to a larger or smaller extent (Bryan, 1998). More specifically, children with LD compared with their non-LD peers: have more social information-processing deficits (Tur-Kaspa & Bryan, 1994), are less popular and more rejected (Stone & LaGreca, 1990), and have fewer mutual friends (Wiener & Schneider, 2002). Children with LD also exhibit higher levels of disruptive and aggressive behaviours (Sale & Carey, 1995), face more difficulties in certain aspects of interpersonal conflict resolution (Agaliotis & Goudiras, 2004), present lower levels of positive social behaviours (Newcomb, Bukowski, & Pattee, 1993), and have more adjustment problems in adolescence than their non-LD counterparts (Kupersmidt, Coie, & Dodge, 1990).

The problems that children with LD face in their social interaction are usually attributed to a lack of skills in initiating and sustaining positive social relationships (Bauminger, Edelsztein, &

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Morash, 2005), which are deemed essential for successful social interactions (Bryan, Donalue, Perl, & Sturm, 1981) and for the effective inclusion of children with LD in the classroom's social interaction network (Winzer, 2000). Both initiation of, and response to, a social interaction presuppose the possession and effective use of verbal and/or nonverbal communication skills, since these are the means through which the participants of an interaction convey their intentions and emotions (Beilinson & Olswang, 2003). However, children with LD have deficits in initiating (e.g., asking another child to play) and in responding (e.g., following another child's invitation to play) behaviours in comparison to children with average/high achievement (Vaughn & Hogan, 1994; Vaughn, Zaragoza, Hogan, & Walker, 1993).

Children with LD are believed to face difficulties in identifying expressive (Holder & Kirkpatrick, 1991) and situational cues (Nabuzoka & Smith, 1995) and in decoding nonverbal cues (Creasey & Jarvis, 1987). They receive or send nonverbal emotional information in a way that differs from that of typically developing children (Bauminger et al., 2005). As far as the response to an initiation of an interaction is concerned, children with LD are likely to misinterpret the initiation attempt of a peer and to respond to it as if it were hostile (Nabuzoka & Smith, 1999), because they exhibit reduced ability to understand nonverbal aspects of communication (Bryan, 1998) and they face difficulties with the performance of social-cognitive processes underlying the situational cues and the other person's intentions involved in a social interaction (Vaughn, Elbaum, & Boardman, 2001).

Some scientists (e.g. De Paulo & Rosenthal, 1978; Dimitrovsky, Spector, Levy-Shiff, & Vakil, 1998) have taken the view that at least certain aspects of nonverbal communication skills improve with age, while others have (e.g. Holder & Kirkpatrick, 1991) concluded that these skills remain unaffected by maturation. For example, a developmental differentiation has been observed in the ability of children with LD to distinguish among serious and playful fighting, which includes also the interpretation of nonverbal behaviour with older children with LD being more able to make this distinction (Nabuzoka & Smith, 1999). Age differences were reported also in friendship patterns of children with and without LD (Wiener & Schneider, 2002). However, although the documentation of social skills deficits in childhood (e.g., Nabuzoka & Smith, 1995), in adolescence (e.g., Most & Greenbank, 2000), and in adulthood (e.g., Goldberg, Higgins, Raskind, & Herman, 2003) suggests an element of continuity, the need to look at age differences in the existence of social skills deficits through longitudinal or cross-sectional studies (Bauminger et al., 2005) has been largely overlooked; an issue that will be addressed in this paper.

A further point of interest in the present study is the nonverbal social interaction skills of children with LD. The distinction between social competence and social skills, which are interrelated but not identical as pointed out by Elksnin and Elksnin (2004) and McFall (1982) is adopted. Social competence constitutes mainly an evaluative term that is based on judgements that people make regarding their performance on a social task. Social skills, on the other hand, represent a specific behaviour that people exhibit in specific situations in order to perform competently on social tasks (Rubin, Bukowski, & Parker, 1998). The social deficits that characterise individuals with LD refer to either acquisition deficits or performance deficits (Gresham, 1981). Acquisition deficits are social skills deficits in which the individual does not possess a particular social skill. Performance deficits refer to the individual's failure to perform the social skills that he/she possesses (Kavale & Forness, 1995).

Most studies have focused on perception and comprehension of nonverbal communication (e.g., Bauminger et al., 2005); that is, nonverbal acquisition social skills. Researchers assessed children's accuracy in labeling photographs or silent-film scenarios (Nabuzoka & Smith, 1995),

auditory and visual recordings of everyday basic emotions (Axelrod, 1982; Reiff & Gerber, 1990), as well as ‘real-life’ situations using videotaped or vignette descriptions (Meadan & Halle, 2004), where children with LD perform consistently worse than children without LD (Kavale & Forness, 1996; Swanson & Malone, 1992). Bryan (1977) claimed that the less accurate understanding of nonverbal communication might actually influence the behavioural interaction of these children. Feldman, Philippot, and Custrini (1991) demonstrated that nonverbal behavioural skills are essential components of interpersonal success, since emotional states are communicated primarily through the nonverbal channel. Children who make nonverbal errors face problems with the communication of information that is required for successful interpersonal interactions. Although both verbal and nonverbal communication are essential for successful relationship development (Riggio, 1992), nonverbal cues are unique in comparison to verbal messages because they are more continuous, they are sent and received with less awareness, and their misuse often creates negative social reactions (Nowicki & Duke, 2002). Gesture, for example, may convey information that is not conveyed through speech since iconicity reduces cognitive load (Goldin-Meadow, 2000). However, the present authors in their literature search failed to find any studies that examine the production of nonverbal social cues or nonverbal performance social skills, which constitute the focus of the present study.

Therefore, the aim of this study is not to establish a unique nonverbal social skills profile of individuals with LD, but to try to accurately identify the production of nonverbal social interaction skills by children with LD and to identify any developmental changes. It is expected that children with LD of different age groups will differ in terms of both nonverbal initiations and responses in comparison to children without LD from the same age groups.

1. Method

1.1. Participants

The sample comprised of 36 children with LD (24 boys and 12 girls) between 6 and 12 years old (mean age 8.10 years, S.D. = 1.79) and 36 children without LD, who were matched for age, gender, and socio-economic status. All children were attending grades 1–6 in 10 inclusion schools in the broader area of Thessaloniki, Greece, which were randomly selected from a list of all the inclusion schools in the municipality—each inclusion school has approximately 3–4 children diagnosed with learning disabilities. Thirty-six children (18 with LD and 18 without LD, 20 boys and 16 girls) were in grades 1–3 and 36 children (18 with LD and 18 without LD, 28 boys and 8 girls) were in grades 4–6. Since one of the aims of the study was to look at age differences in nonverbal initiations and responses, grade is included as an independent variable. The distinction between grades 1–3 and grades 4–6 is imposed by the Greek national curriculum and was adopted in the present study. This distinction reflects a change in the cognitive demands, the marking criteria, as well as the amount and kind of material that is taught to the students. Furthermore, since some preliminary analyses indicated that there were no gender differences on nonverbal initiations and responses, gender was not included as an independent variable.

The researchers contacted the local educational authority and asked the psychologists who work there to identify the children in the community who were diagnosed with LD by their agency. All the children with LD who were selected for the present study met the following criteria: (a) they attended primary inclusion schools, (b) they did not experience any kind of sensory problems or impairments, mental retardation, or psychiatric or conduct disorder, (c) they

had a full scale IQ of higher than 80 ($M = 102.7$, $S.D. = 13.5$) according to Wechsler Intelligence Scale for Children (WISC-3, 1991) (WISC has been standardised into Greek using a very large sample of school children aged between 6 and 17 in Georgas, Paraskevopoulos, Besevegis, and Giannitsas (1997)), and (d) they performed average in mental ability and below average in: (1) memory sequences (recall of numbers, pictures, and shapes), (2) sentence and word completion, and (3) phonological awareness (distinction of graphemes and phonemes, composition of phonemes) according to ATHENA test (Paraskevopoulos, Kalatzi-Azizi, & Giannitsas, 1999). The ATHENA test is developed for the diagnosis of learning disorders and it is based on Aston Index (Newton & Thomson, 1982) and on the Illinois Test of Psycholinguistic Abilities—ITPA (Kirk, McCarthy, & Kirk, 1968). The ATHENA test was standardised using a sample of 1160 children. It has high internal validity and split-half reliability (between 0.80 and 0.90) (Paraskevopoulos, Kalatzi-Azizi, & Giannitsas, 1999).

The next step was to contact the schools of the 40 children with LD who met the above-mentioned criteria and to verify with their teachers that they were behind their peers in terms of reading, writing, or mathematics and that they received low grades. The teachers had administered Greek widely used curriculum-based tests to assess the students' reading, writing, and mathematic skills, where the children with LD performed inadequately. However, the teachers were not allowed to reveal the scores because of school regulations regarding privacy. The researchers were allowed access only to the students' grades; children with LD received lower grades (average just above the pass grade) in comparison to their classmates without LD (average well above the pass grade). The children with LD received extra support in resource rooms; they spent an average of 8 h per week in a resource room, where they received extra support in reading, writing, or mathematics by a special needs educator.

Greece is a country that follows the one-track approach, which is geared towards inclusion of almost all pupils (EADSNE, 2003). Children with special education needs receive additional help through tasks that are jointly prepared given by the regular and the special education teachers. However, children with special needs do not get an individualised curriculum and there are no written individual educational programs (Ministry of Education, 2001). Approximately 1/3 of these children were under the supervision of professionals outside the school setting who helped them mainly with their homework. The parents of all 40 children were informed of the purpose of the present study, and 36 parents gave their informed consent for their child to participate.

The final procedure was to ask teachers to identify for each child with LD 3 children of the same sex from his/her class who had average or above average performance but were not the best students of their class. One of them was then randomly selected to form the control group and informed consent was solicited from his/her parents to participate in the present study. Finally, the ATHENA test was administered also to these typically developing children and the characteristics for the whole sample are presented in Table 1.

1.2. Materials/procedure

The study started in October and ended in December 2005. Each child was observed for 40 min during the break (four breaks lasting 10 min each) spread over a month so as to ensure that the behaviours recorded were representative of each child. Although it would be desirable to observe each child for more than 40 min, it was not possible due to restrictions in access, time, and resources. During the breaks children were able to engage in free play sessions—a behaviour that is not encouraged inside the classroom. Since these free play activities take place outdoors in

Table 1
Performance in ATHENA test of participants with and without LD

ATHENA test	M (S.D.)	
	Children with LD (n = 36)	Children without LD (n = 36)
Mental ability	8.10 (3.7)	9.31 (2.8)
Memory sequences	6.09 (2.8)	8.57 (2.3)
Sentence/word completion	6.45 (3)	8.63 (2.7)
Phonological awareness	7.54 (4.2)	9.87 (3.4)

the schoolyard, the games that children engage in are neither scheduled nor structured and they involve mainly physical activities such as chase, hide and seek, and football. All the observations took place on days that it was not raining, so that the children could move about more freely. Observations were collected during the middle of the academic year in order to reassure that the children were better acquainted (Laursen & Hartup, 1989). The two female undergraduate psychology students who were trained as observers were blind to the group membership of the participants and to the hypotheses of the study throughout the observation. The training involved explanation and demonstration of the operational definitions of the behaviours to be recorded and the students practiced using them while observing an hour-long videotape of children playing in the playground. In order to ensure further that the observers were well trained, a small pilot study was conducted with six children. Then, the observers were introduced to the children and they spent a few days in each school to allow the children to adjust to their presence, as well as to memorise the participants' names. Since the observers were instructed not to interact a lot with the children, they were eventually largely ignored, fulfilling thus a primary objective of observations (Pellegrini, 2001). As children move a lot when they are in the schoolyard, it was easier to record their nonverbal interactions by standing a few feet away from them and not by using a recording device, which anyway posed a serious issue for the parents, the teachers, and the school principals. Therefore, the researchers developed structured coding forms and relied for data collection on written records of live observations. In order to code nonverbal initiations and responses, event coding was employed (Beilinson & Olswang, 2003). Observers stayed close to the focal children and tried to remain unobtrusive by pretending to study information on the clipboards that they were holding.

Observations were then transformed into continuous measurements of nonverbal initiations and responses. Each observer had an observational form attached to her clipboard that contained a list with different exemplars of nonverbal initiations and responses. The operational definitions of nonverbal initiations and responses were adopted from those proposed by Hodgens, Cole, and Boldizar (2000). Nonverbal initiation is defined as: 'when the child makes a nonverbal or motoric attempt to initiate an interaction with another peer and has not received an initiation from that peer'. Examples of nonverbal initiations that were recorded in this study were the following: looking at the peer without doing anything, smiling at the peer, gently pushing the peer, a light touch or pat on the peer's back to obtain attention and holding the peer's hand. Nonverbal response is defined as: 'when the child receives a verbal or motoric attempt to initiate an interaction from another peer with whom he had no prior interaction and responds in a nonverbal or motoric way'. Examples of nonverbal responses in this study were: approaching the peer, following the peer around, smiling at the peer, or hugging the peer. Similar nonverbal behaviours were identified also by Hall and McGregor (2000) and Kalyva and Avramidis (2005). It should be emphasised that the observers focused only on nonverbal and not on verbal interactions between

the focal children and their peers; a topic that could be addressed in future studies. Furthermore, the observers were asked to record each nonverbal initiation and response of the focal child, irrespective of whether it was acknowledged by the peer or not. Finally, behavioural counts were added across observation periods for the purpose of deriving nonverbal initiations and responses scores for each participant. Counts were made each time that a nonverbal behaviour was exhibited. Only behaviours that had a break in between counted as separate, irrespective of how long they lasted.

Interrater agreement was assessed with 12 children, for a total of 8 h of observation. The independent observer was a psychologist who was seated next to the experimenter and collected data using the same observation protocol. Kappa reliability – a statistic used to assess interrater reliability when observing or otherwise coding qualitative/categorical variables – was 0.91 for general categories and 0.93 for individual behaviours (generally, a Kappa > 0.70 is considered satisfactory).

2. Results

The data were analysed using two-way ANOVA, which showed that no significant main effects were obtained for age ($F(1,68) = 0.05, p > 0.05, \eta^2 = 0.00$) and learning disabilities ($F(1,68) = 0.81, p > 0.05, \eta^2 = 0.01$) on nonverbal initiations. However, there was a quite strong and significant effect for their interaction ($F(1,68) = 9.54, p < 0.005, \eta^2 = 0.12$). Further analysis showed that among younger children attending grades 1–3, children with learning disabilities ($M = 11.30, S.D. = 4.68$) exhibited significantly fewer nonverbal initiations ($t = -2.85, d.f. = 34, p < 0.01, \eta^2 = 0.19$) than children without learning disabilities ($M = 16.81, S.D. = 6.89$). Moreover, among older children attending grades 4–6, children with learning disabilities ($M = 15.88, S.D. = 6.16$) exhibited more nonverbal initiations ($t = 1.53, d.f. = 34, p > 0.05, \eta^2 = 0.06$) than children without learning disabilities ($M = 12.85, S.D. = 5.67$), although this difference was not statistically significant (see Table 2).

A two-way ANOVA showed that no significant main effects were obtained for age ($F(1,68) = 0.01, p > 0.05, \eta^2 = 0.00$), learning disabilities ($F(1,68) = 0.31, p > 0.05, \eta^2 = 0.00$), or their interaction ($F(1,68) = 1.41, p > 0.05, \eta^2 = 0.02$) on nonverbal responses. Among younger children attending grades 1–3, children with learning disabilities ($M = 13.80, S.D. = 6.79$) exhibited fewer nonverbal responses ($t = -1.25, d.f. = 34, p > 0.05, \eta^2 = 0.04$) than children without learning disabilities ($M = 16.56, S.D. = 6.33$), although this difference was not statistically significant. Moreover, among older children attending grades 4–6, children with learning disabilities ($M = 15.50, S.D. = 8.68$) exhibited more nonverbal responses ($t = 0.44, d.f. = 34, p > 0.05, \eta^2 = 0.01$) than children without learning disabilities ($M = 14.50, S.D. = 4.73$), although this difference was not statistically significant (see Table 3).

Table 2
Two-way ANOVA of nonverbal initiations of younger and older children with and without LD

Source of variation	SS	d.f.	MS	F	η^2
Age	1.67	1	1.67	0.05	0.00
Learning disabilities	27.51	1	27.51	0.81	0.01
Age with learning disabilities	323.95	1	323.95	9.54*	0.12
Error	2308.93	68	33.95		

* $p < 0.005$.

Table 3
Two-way ANOVA of nonverbal responses of younger and older children with and without LD

Source of variation	SS	d.f.	MS	F	η^2
Age	0.58	1	0.58	0.01	0.00
Learning disabilities	13.81	1	13.81	0.31	0.00
Age with learning disabilities	62.92	1	62.92	1.41	0.02
Error	3034.14	68	44.62		

3. Discussion

The aim of the present study was to explore the nonverbal social interaction skills of children with LD and to investigate developmental differences by age. It was found that younger and older children with LD did not vary greatly from younger and older children without LD in their nonverbal responses and that older children with LD did not differ in their nonverbal initiations from older children without LD; however, younger children with LD exhibit fewer nonverbal initiations than younger children without LD. Since most studies up-to-date focused on the perception and comprehension of nonverbal behaviour by children with LD (Bauminger et al., 2005) and not on the actual production of nonverbal social behaviours, it is inevitable to try to account for these findings based on assumptions that are drawn from related research. Only two studies looked at differences between children with LD and their non-disabled peers in terms of performance of nonverbal behaviour and failed as well to find any particularly significant differences between them: Raskind (1983), who reported that children with LD differed from their typically developing peers in terms of their nonverbal behaviour only in their body lean; and Grogan (1988), who explored differences in verbal and nonverbal communication between children with reading disabilities and adequate readers by focusing on the nonverbal expressions of children with LD who were interviewed and found differences only in verbal communication.

The lack of differentiation in terms of nonverbal responses between children with and without LD corresponds to the observation that children who face problems with their social skills are more able to respond to peer attempts for communication than to find a way to approach and communicate with a peer, as is evident from research on children with autism spectrum disorders (Prizant & Wetherby, 1987). Responses require less cognitive awareness and intentionality, since a simple imitation of the peer's approach would suffice and it could even become automatic in some cases (Lewy & Dawson, 1992).

The differences that were identified in nonverbal initiations could be attributed to the fact that they presuppose knowledge of social norms, effective decoding of social situations, and enhanced self-esteem; qualities that children with LD do not often possess to a satisfactory degree (Beilinson & Olswang, 2003). Dodge, Schlundt, Schocken, and Delugach (1983) and Putallaz and Gottman (1981) suggested that successful peer-group entry comprises of three factors: (a) combination of effective tactics, (b) use of low-risk tactics, such as waiting and hovering, instead of high-risk tactics, such as making a verbal statement or asking questions, and (c) avoidance of attention directed to the child with LD that is accomplished by minimal disruption of the group processes. Many initiations that were recorded in this study (e.g., smiling, looking, waiting) represent low-risk tactics and further research should explore the transition to high-risk tactics that include verbal skills, since it is likely that children with LD who face difficulties in their verbal skills practice their nonverbal communication skills more in order to make up for their social deficits (Bryan, 1977).

Vaughn et al. (1993) reported that the differences they found in the initiating and responding skills among children with LD and children with average/high achievement had disappeared by

the fifth grade. The authors suggested that by third grade, young children can more clearly understand both the rules and the expectations of the school environment to which they have to comply in order to gain peer acceptance. This might explain why younger children with LD exhibited fewer nonverbal initiations than younger children without LD—a difference that was no longer evident in older children with LD.

Another plausible explanation for the differences that were observed in the nonverbal initiations of younger and older children with and without LD is the discrepancy in their social networks (Wiener & Schneider, 2002). Namely, younger children may not have chosen their friends, experimenting thus with different peers in different settings in search of more stable relationships. Older children, on the other hand, may have already formed friendships with their peers, feeling more confident to interact with them. Therefore, it is possible that young children with LD who are still experimenting exhibit fewer nonverbal initiations than their non-LD peers, while older children with LD who feel more confident with their peers initiate interactions nonverbally as often as their peers without LD.

Since this is one of the first studies that examined the actual nonverbal initiations and responses of children with LD, it has some limitations that should be addressed in further research: (a) the observations took place only in one context, while observations in multiple settings would lead to more conclusive findings; (b) the observations focused only on the target child and not on the peer with whom this child was interacting, failing thus to address to some extent the reciprocal nature of the social exchange; (c) the observations were not supplemented by interviews with the children, their peers, their parents, or their teachers that would enrich the collected data and enhance the understanding of the findings; (d) no distinction was made between the different kinds of nonverbal initiations and responses that were recorded; (e) the nonverbal social interaction skills were not combined with verbal ones in order to obtain a broader understanding of the social skills exhibited by children with LD—although as Cooley and Triemer (2002) pointed out it is important to understand specific nonverbal skill problems and correlates in order to develop effective intervention programs; (f) this study examined the frequency (quantity) and not the appropriateness (quality) of the nonverbal social behaviours—a parameter that might account for the lack of group differences in nonverbal responses; (g) the study explored only the beginning of a social interaction and not its maintenance, which might account for the lack of major discrepancies between children with and without LD that are reported in many other studies.

Future research should explore the possibility that children with LD are successful in initiating a social relationship but do not possess the necessary skills to continue and expand this interaction (Boucher, 1986; Grogan, 1988). Another interesting point for future research would be to concentrate on potential differences in the preferred modes of initiation and response among different sub-types of children with LD, such as children with dyslexia or dyscalculia. The findings that will stem out of this proposed future research should be incorporated into peer-based strategies that aim at enhancing both the cognitive and social skills of children with LD in the school setting.

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