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Social interactions are crucial to everyday life even though most people take their use of language to interact with others for granted. For children with language impairments, however, the act of reciprocal communication does not come easily. Children with autism and specific language impairment (SLI) are two groups who present poorly developed social interaction skills. Although both types of children are poor communicators, their deficits are not identical. In autism, the major deficit involves impairments in both social interaction skills and communication ability (American Psychiatric Association, 1994). In children with SLI the deficit is thought to primarily involve language without severe deficits in social attachments and/or other areas of social development (Bishop, 1997). The purpose of this study was to examine the social interaction deficits of a child with autism as related (in either similar or different ways) to the social interaction deficits of children with SLI. As background, literature on autism and SLI will be reviewed in this chapter.

Children with Autism

According to Rutter (1978), children with autism exhibit serious social difficulties in the areas of cooperative group play, personal friendships, and the perceiving of others' feelings. Because of these deficits, children with autism are often seen as being socially inappropriate. In fact, one of the primary diagnostic features of autism is a deficit in the development of reciprocal social interaction and communication. Below are the specific criteria used by the American Psychiatric Association (1994) in the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition* (DSM-IV) to diagnose autism.

Table 1

Diagnostic criteria for autistic disorder.

A. A total of six (or more) items from (1), (2), and (3), with at least two from (1), and one each from (2) AND (3):

(1) qualitative impairment in social interaction, as manifested by at least two of the following:

(a) marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction

(b) failure to develop peer relationships appropriate to development level

(c) a lack of spontaneous seeking to share employment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest)

(d) lack of social or emotional reciprocity

(2) qualitative impairments in communication as manifested by at least one of the following:

(a) delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)

(b) in individuals with adequate speech, marked impairments to the ability to initiate or sustain a conversation with others

(c) stereotyped and repetitive use of language or idiosyncratic language

(d) lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level

(3) restricted repetitive and stereotyped patterns of behaviors, interests, and restricted patterns of interest that is abnormal either in intensity or focus

(a) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus

(b) apparently inflexible adherence to specific, nonfunctional routines or rituals

(c) stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements)

(d) persistent preoccupation with parts of objects

B. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years: (1) social interaction, (2) language as used in social communication, or (3) symbolic or imaginative play.

C. The disturbance is not better accounted for by Rett's Disorder or Childhood Disintegrative Disorder.

One example of a study that documented the social deficits of children with autism was completed by Honig and McCarron (1988). They studied ten typical children,

four children with autism, and one child with multiple handicaps in a mainstreamed preschool. Initiations of five types of social skills were observed in the children. The behaviors were sharing, helping, cooperating, sympathy, and praise. Each child was observed in four preschool settings: free play, circle time, structured play, and gym. Only initiations directed towards a peer were recorded. In general, for all child profiles the target behaviors were most frequent during free play and least frequent during circle time, but the average number of initiations made by typical peers was approximately twice that of the atypical children (M=21 vs. 10.2). These results also showed typical children initiating with other typical children much more frequently than with the atypical children. In fact, all of the children were two times more likely to interact with a typical child than with a child who presented an impairment.

Children with SLI

According to Tomblin and Buckwalter (1994), the label SLI is used to refer to a child with a language impairment who does not present other developmental deficits. As of yet, however, the singular nature of this impairment is hotly debated and the primary cause of this child profile remains elusive. The diagnostic criteria for SLI can be found in the *International Classification for Diseases, 10th Edition (ICD-10)* (World Health Organization, 1992). The criteria are in Table 2.

Table 2

ICD-10 diagnostic criteria for specific language disorder.

- Language skills, as assessed on standardized tests, are below the 2 standard deviations limit for the child's age
- Language skills are at least one standard deviation below nonverbal IQ as assessed on standardized tests
- There are no neurological, sensory, or physical impairments that directly affect use of spoken language, nor is there a pervasive developmental disorder
- A distinction is made between *receptive* language disorder, where comprehension is more than 2 standard deviations below age level, and *expressive* language disorder, where only expressive language is this severely affected, and where understanding and use of nonverbal communication and imaginative language functions are within normal range

In the field of speech pathology Stark and Tallal (1981) provide additional criteria for an SLI diagnosis (see Table 3). Like the ICD-10 criteria, their list includes both inclusionary and exclusionary characteristics of the disorder.

Table 3

Stark and Tallal's (1981) criteria for specific language impairment.

- Normal hearing on pure tone screening
- No known history of recurrent otitis media
- No emotional or behavioral problems sufficiently severe to merit intervention
- Performance IQ of 85 or above
- Normal neurological status
- No peripheral oral motor or sensory deficits
- Articulation age no more than 6 months below expressive language age
- In children aged 7 and above, reading age nor more than 6 months below language age
- Language age at least 12 months lower than chronological age or performance mental age, whichever was the lower
- Receptive age at least 6 months lower than chronological age or performance mental age, whichever was the lower
- Expressive language age at least 12 months lower than chronological age or performance mental age, whichever was the lower

Deficits in language skills are common to both children with autism and children with SLI, but this commonality does not mean that these two profiles are the same. As

stated in the diagnosis criteria, children with SLI should not be diagnosed as autistic. Nevertheless, children with SLI do present decreased social skills. One study that documented decreased social skills in children with SLI was done by Rice, Sell, and Hadley (1991). In their study, children attending a preschool were observed using the Social Interactive Coding System (SICS; Rice, Sell, & Hadley, 1990). According to Rice, et al., the main purpose of SICS is to record the pattern of initiations and responses in a preschooler's social exchanges. Recorded items include the child's play area and activity, who the child addresses, whether the child is initiating or responding, and the level of the child's play. Data collection was done over a period of three months, giving each child approximately 60 minutes of individual observation time.

The children enrolled in the preschool were classified into four groups according to language development. The two groups of interest to this review were children with normally developing language skills and those with SLI. Nine children were in the former group and six were in the latter. On-line data were collected by observers using a "5-minute-on, 5-minute-off" format. All social interactions were coded within the first five-minute segment, and a break was then taken for the next five minutes.

Results of the study showed no significant difference in the total number of initiations by children with normal language and children with SLI. However, when looking at the addressee of the initiations, the children with normal language development directed a higher percentage of their initiations to peers (51%) than did the children with SLI (36%). The normal children were also more than 10 times more likely to be addressed by their peers (M=3.73) than were the children with SLI (M=0.35).

Another study documenting the communication deficits of children with SLI was done by Brinton and Fujiki (1982). Their study examined the request-response sequences in discourse of children with and without language impairment. Their data were discourse samples from six dyads of children (three with impairments and three normal). The samples were then coded and transcribed according to a speech act framework that focused on three types of speech acts: choice or alternative questions, product questions, and requests for clarification. Choice questions consisted of either/or questions and yes/no questions in which the listener was asked to select one option. Product questions consisted of "wh" questions like who, what, and where. The third type of speech act measured was requests for clarification, which included requests for repair, clarification, or confirmation of the preceding speech act.

The following findings were reported. Normal children produced more appropriate responses to choice questions (34 total appropriate responses) compared to disordered children (8 total appropriate responses). Normal children also had more appropriate responses to product questions (15 total appropriate responses) and requests for clarification (29 total appropriate responses) than the children with language impairments (7 total appropriate responses for product questions and 5 total responses for requests for clarification). Finally, in addition to giving inappropriate responses, children with language disabilities frequently ignored all three types of questions.

What is interesting about the above literature is the finding that social interaction skills are weak in both children with autism and children with SLI. A review of intervention studies further highlights this finding. Appendix A provides a review of five studies of children with autism and two studies of children with SLI. Regardless of

diagnosis, social interaction weaknesses included initiations by the child and the child's responses to initiations. Also, the duration of social interactions involving children with autism and children with SLI was shorter than interactions involving only typical children.

The current study examined in more detail the social interaction skills of one child with autism. The investigation was descriptive in nature and followed a case study research design. For the purpose of this study, the target child is referred to as Simon. Simon was observed at a preschool for speech and language impaired children. Using methods developed by Rice, et al. (1990), this study described Simon's social interactions during free play at the preschool. These data were then compared to previously reported findings from children with SLI.

Research Questions

1. Does Simon initiate to others (adults and peers) at the same rate as children with SLI?
2. Does Simon initiate to peers at the same rate as children with SLI?
3. Is Simon's level of interactions (nonverbal responses, imitations, and one-word responses vs. multi-word responses) similar to that of children with SLI?

METHOD

Subject

At the time of the study Simon was a five-year-old male. Simon was diagnosed as having high functioning autism in September 2003. Simon's case history indicated normal vision acuity and normal hearing bilaterally. Simon's previous therapy included attending the LSU Language Preschool two times a week from Fall 2001 through Spring 2003. He also received occupational therapy and speech therapy twice weekly through 2003.

Simon's case history also showed two speech and language evaluations, one when Simon was 26 months (March 2001), and again when he was 34 months (October 2001). Social language deficits were documented in both sessions. For example, in October 2001, the Ages and Stages Questionnaire was administered. This test is a screening tool for developmental delays for children under five years of age. Simon's mother answered "yes", "sometimes", and "not yet" to a variety of questions, and these answers were then converted to a raw score. Also, for each developmental area, a cutoff score is provided in the manual to help determine if a child should receive intervention. Simon's scores are listed in Table 4. As shown by these results, Simon functioned below the cut-off score for all areas except gross motor skills.

Table 4

Results of the Ages and Stages Questionnaire.

Developmental Area	Raw Score	Cutoff Score
Communication	0	35
Gross Motor	45	25
Fine Motor	5	25
Problem Solving	10	25
Personal-Social	0	25

The Westby Symbolic Play Scale-Revised was also administered in October 2001. It is a checklist showing development of symbolic play and language. Simon was observed during free play and the evaluator determined his level of play skills and language skills using the checklist. Simon's observed play skills were at Presymbolic Level II (13-17 months), or 17 months below his age level at the time. His observed language skills were at Presymbolic Level I (8-12 months), or 22 months below his age level at the time.

At the time of the study, Simon attended the Baton Rouge Speech and Hearing Foundation Preschool. Simon's goals in his preschool class included imitating the actions of others, using "wh" questions, participating in joint attention on tasks, and increasing responses to peers. At the time of the study, Simon also participated in an individual neurodevelopmental program at home.

Setting

Data were collected in the classroom during free play at the Baton Rouge Speech and Hearing Foundation Preschool. Simon's class was made up of eight children (including Simon) who were all diagnosed with language or learning impairments. The adults in the classroom included a teacher who was a licensed speech-language pathologist and a student aide. The class schedule consisted of inside free play, opening circle time, snack, outside play, art, and closing circle time.

Procedure

A variation of SICS by Rice et al. (1990) was used to collect the data. As mentioned earlier, SICS is an on-line system designed as a way to record and describe continuous verbal interactions of preschool children. The coding system allows a researcher to describe the following: play activity, or what the child is doing (e.g., art or manipulable); addressee, or whom the child talks to; type of interaction, (e.g., initiation or response); and play level. Coding definitions can be found in Appendix B. The variables of interest in this study were the number of initiations to others, the proportion of initiations to peers, and the type and level of interactions with others.

The examiner collected data for a consecutive 15-minute period, four times a week for four weeks. This resulted in 240 minutes of observational data. An example of the coding sheet that was used to record the data can be found in Appendix A.

Reliability

In order to obtain a reliability measure, another undergraduate student in communication disorders was asked to independently code Simon's interactions for one session (session 14). Before coding, the student trained for one session. Reliability was calculated by dividing the number of interactional behaviors that were coded in the same way by both raters by the total number of Simon's interactional behaviors. The overall reliability was 90%.

RESULTS

Table 5 presents the interactions coded across the 16-day observation period. The response category includes all one-word responses, multi-word responses, non-verbal responses and imitations.

Table 5

Frequency of coded behaviors.

Day	Initiation	Repeat	Response	Ignore
1	0	0	8	7
2	0	0	7	6
3	0	0	9	5
4	0	0	3	6
5	4	0	7	2
6	0	0	12	5
7	2	0	11	7
8	0	0	14	7
9	0	0	3	2
10	0	0	2	0
11	1	0	11	6
12	0	0	8	9
13	0	0	9	9
14	0	0	3	7
15	1	0	6	4
16	0	0	4	12
SUM	8	0	117	94

As can be seen, responses (one-word responses, multi-word responses, non-verbal responses and imitations) were the most frequent behavior occurring a total of 117 times, followed by ignore which occurred a total of 94 times. Initiations were infrequent occurring only 8 times, and repetitions of initiations never occurred. Addressee was another variable that was measured during the observation period. Of Simon's 219 coded behaviors, 184 (81%) were interactions with adults and only 43 (19%) were interactions with peers.

As noted earlier, there were four different ways Simon responded to the adults and children in his classroom. The frequency and percent of each of the response types is listed in Table 6. As can be seen, most of Simon's responses involved multi-word utterances.

Table 6

Frequency of response types.

One word Responses	Non-verbal Responses	Imitation Responses	Multi-word Responses	Total Responses
30	3	34	50	117
(25.6%)	(2.6%)	(29.1%)	(42.7%)	

To compare Simon's data to those reported for children with SLI, Simon's rates of initiation per five-minutes was calculated. To convert Simon's data, the total number of initiations (8) was divided by the total number of observation minutes (240). This figure was then multiplied by five to represent the number of initiations per five-minute segment. In Table 7, Simon's total was compared to the data collected by Rice, et al. (1991). As can be seen, Simon's rate of initiation was significantly lower than the rates for children with SLI and for children who are typically developing.

Table 7

Number of initiations per five-minute segment.

Simon	Typically Developing Children	Children with SLI
0.17	6.64	6.68
(NA)	(2.59)	(2.28)

Rice et al. (1991) also looked at the proportion of the children's initiations that were directed at peers. To calculate this figure with Simon's data, his number of

initiations directed at peers was divided by his total number of initiations. The results are shown in Table 8.

Table 8

Percentage of initiations directed toward peers.

Simon	Typically Developing Children	Children with SLI
13%	51%	36%

Finally, to compare Simon's use of multi-word responses to those reported by Rice et al. (1991) for children with SLI, the percentage of Simon's multi-word responses out of his total responses is listed in Table 9. As can be seen in this table, Simon's rate of multi-word responses was lower than the two comparison groups.

Table 9

Percentage of multi-word responses.

Simon	Typically Developing Children	Children with SLI
42.7% (NA)	65.7% (10.1)	56.6% (8.6)

DISCUSSION

The purpose of this study was to examine the social interaction skills of one child with autism and compare his results to previous findings in the literature for children with SLI. Three questions guided the research. The results of this study will be discussed in terms of these three questions. The first question focused on the rate of Simon's interactions compared to those of children with SLI. This study found that the rate of Simon's initiations to others (adults and peers) was significantly lower than the rate that has been previously reported for children with SLI. In fact, Simon's rate of 0.17 was 39 times less than the 6.68 rate of children with SLI.

The second research question targeted the percentage of Simon's initiations that were directed towards peers. Simon had eight initiations, and one (13%) was directed at a peer. In comparison, the children with SLI initiated with peers 36% of the time. Again, Simon's rate of initiations to peers was much lower than the previously reported rates of children with SLI. Finally, question three focused on Simon's responses to initiations. The higher the percentage of multi-word responses out of total responses, the higher a child's level of responding is thought to be. Simon's response level was found to be lower than that of previously studied children with SLI because 42.7% of his responses were multi-word utterances, whereas multi-word responses accounted for 56.6% of the responses by children with SLI.

There were three main limitations to this study. The first limitation was that data was collected on only one child. Simon's behavior may not have been typical of all children with autism, so generalizations are difficult to make. The second limitation involved the sampling context. Data were collected for only 15 minutes per day in only one setting—during free play time with the same group of children and the same teacher. Nevertheless, the context that was used did match that of the comparative work by Rice et al (1991).

The coding system itself was the third weakness in that it was designed for children with language impairments and not for children with autism. With the SICS system, there is no way to record the actual length of each utterance because any response two words or longer is coded as a multi-word response. SICS has no way to code for joint attention, eye gaze, or recognition of nonverbal cues which are often weak in children with autism. Finally, SICS does not allow for recording any actual utterances,

so there is no distinction among types of speech acts or the complexity of an utterance. For example, a common response from Simon was the formulaic use of "No, Ma'am." The SICS system used here did not allow the researcher to distinguish between formulaic responses and generative ones.

Future directions for research include using a larger sample of children with autism and observing the children in different contexts including both familiar and unfamiliar settings. Videotaping observation sessions may also improve the quality of the analysis. Unlike the time-sampling method that was used in the current work, a videotaped record of Simon's behaviors would have afforded an in-depth analysis of the many atypical nonverbal behaviors that are frequently observed in children with autism. For example, with videotaped sessions, nonverbal behaviors such as eye gaze, joint attention, and recognition of nonverbal cues could have been coded. Finally, with videotaping or audiotaping, one would be able to examine the type and complexity of Simon's speech acts and the specific length of his utterances.

References

American Psychiatric Association. (1994). Diagnostic and Statistical Manual of Mental Disorders (4th Ed.) (DSM-IV). Washington, D.C.: American Psychiatric Association

Bishop, D.V.M. (1997). Uncommon understanding: Development and disorders of language comprehension in children. Cambridge, UK: Psychology Press.

Brinton, B., & Fujiki, M. (1982). A comparison of request-response sequences in the discourse of normal and language-disordered children. Journal of Speech and Hearing Disorders, 47, 57-62.

Honig, A.S., & McCarron, P.A. (1988). Prosocial behaviors of handicapped and typical peers in an integrated preschool. Early Child Development and Care, 33, 113-125.

Rice, M.L., Sell, M.A., & Hadley, P.A. (1990). The social interactive coding system (SICS): An on-line, clinically relevant descriptive tool. Language, Speech, and Hearing Services in Schools, 21, 2-14.

Rice, M.L., Sell, M.A., & Hadley, P.A. (1991). Social interactions of speech and language impaired children. Journal of Speech and Hearing Research, 34, 1299-1307.

Rutter, M. (1978). Autism, a reappraisal of concepts and treatments. New York: Plenum Press.

Stark, R.E. and Tallal, P. (1981). Selection of children with specific language deficits. Journal of Speech and Hearing Disorders, 46, 114-122.

Tomblin, J.B. & Buckwalter, P.R. (1994). Studies of genetics of specific language impairment. In R. Watkins & M. Rice (Eds.), Specific language impairments in children. Baltimore, MD: Paul H. Brookes.

World Health Organization. (1992). The ICD-10 classification for mental and behavioral disorders: Clinical descriptions and diagnostic guidelines. Geneva, Switzerland: WHO.

Appendix A

Author/date	Participants	Measures of Social Interactions	Methods of Collection
Kamps et al (1992)	3 males (all 7 years old) with high functioning autism Multiple baseline design across subjects	1. initiations 2. responses 3. duration of interaction 4 .helping 5. sharing 6. listening 7. compliments	Observation system: SICS Teacher rating scale: 21-item social skill rating scale Measures were taken during 20-minute play sessions during baseline (2-6 weeks), social skills training (2-3 weeks per skill), feedback for social skills (each training day) and follow-up (one month later)
Brady, McEvoy, Wehby, and Ellis (1987)	1 male (11 years old) with autism Single-subject design	1. initiations 2. responses 3. duration of interaction	Social interaction observation system Measures were taken during 12-munute play sessions during baseline (4 days), social skills training (16 days), and generalization sessions (each training day)
Pierce and Schreibman (1997)	2 boys (7 years and 8 years old) with autism Multiple baseline design across subjects	1. verbal initiations 2. play initiations 3. maintenance of interactions	Measures were taken during baseline (over 4 months) and following social skills training (2 months later). Video-taped 10-minute play sessions were used to record data.
McGee, Almeida, Sulzer-Azaroff, and Feldman (1992)	3 boys (3 years, 4 years, and 5 years old) with autism Multiple baseline design across subjects	1. initiations to and from target child 2. cognitive competence 3. physical competence 4. peer acceptance	Social interaction observation system Teacher Rating Scale: The Pictorial Scale of Perceived Competence and Social Acceptance for Young Children Peer Rating Scale: peers evaluated each other and the target children using a picture rating sociometric measure Measures were taken during baseline, peer social skills training, and two fading sessions of reduced teacher involvement. Videotaped 5-minute observations per child were used to record data.

Author/date	Participants	Measures of Social Interaction	Methods of Collection
McGrath, Bosch, Sullivan, and Fuqua (2003)	1 boy (4 years old) with autism Single-subject design	1. initiations to and from target child 2. responses to and from target child 3. duration of interaction	Observation system: Behavioral Play Coding Scheme (BPCS)- Social validity ratings: 10 social validity questions answered by 2 professionals Measures were taken in 10-minute play sessions during baseline and following social skills training of peers and the target child
Robertson and Weismer (1997) Study 1	20 children with SLI (mean age of 4;2) 10 control children pretest-posttest group design with follow-up	1. number of words in the script report 2. number of different words 3. number of play-theme-related acts 4. linguistic markers	Recorded scripts for playing house immediately before intervention, immediately following treatment, and 3 weeks after treatment
Schuele and Rice (1995)	Four boys with SLI (3;10 to 5;3) Single-subject design	1. initiations to and from target child 2. responses to and from target child	Redirect Coding System (RCS): Measures were taken for 30 consecutive minutes during center time activities during baseline and training. SICS: Measures were taken in 5-rain segments alternating between children during baseline and again after intervention.

Appendix B

Free Play Observation Sheet

child's name: _____ date: _____

Start Time	Play Activity	Addressee	Type of Interaction	Play Level

Start time-record the time at which each 15-minute coding segment begins

Play activity-defined by play activity (e.g. art or blocks)

Addressee-record if interlocutor is an adult or a peer

Verbal Interactive Status-

Initiation (I)-a verbal attempt by a child to begin an interaction with another person
Repeat (rep)-repetition of verbalization if the first initiation attempt fails
Response—
Verbal-verbalizations following another person's utterance/turn
(R-V-I)-one-word verbal response
(R-V)-multiword verbal response
Nonverbal (R-NV)-nonverbal behavior that serves as a child's turn (e.g. head nod, smile)
Imitation (IM)-child imitates verbalization of another person
Ignored (ignore)-another person's verbalization(s) is ignored

Play Level-refers only to child's interaction with another child (not with adult only interactions)
Solitary (sol)-child plays by self with no other child in the area for a period of one minute or more
Adjacent (adj)-child plays by self with another child also playing in the area
Social Interactive (SI)-child plays with another child in an interactive manner with the toys/materials available in the area