Profiles of Language and Communication Skills in Autism

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Language in autism appears to be best characterized by a selective deficit in applying language forms for purposes of functional communication. This pattern of selective deficit has been called the “form/function dissociation.” This article outlines the language characteristics most often associated with autism and considers whether the observed patterns are specific to autism as a syndrome. Those characteristics that appear to be syndrome-specific are analyzed from the perspective of the form/function dissociation. Intervention considerations are briefly reviewed.

Key Words: language; communication; autism; syndrome-specific deficit; pragmatics; semantics; syntax; phonology

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Language is a fundamental component of all known human societies; in fact, it has been argued to be the tool by which intellectual, social, and cultural achievements are organized in adults and passed along to children [Vygotsky 1934/1986]. In addition to its socio-cultural value, the symbolic skills enabled by language promote levels of abstract thinking that otherwise would be impossible [Deacon, 1997]. To the extent that a cognitive disability interferes with language processes, an individual's social and intellectual advancement will be correspondingly limited. These issues are of importance when an individual is diagnosed with autism, a condition defined in part by the presence of language impairments. In this article, I outline the language characteristics most often associated with autism. I consider whether the observed patterns are specific to autism or whether they could be accounted for by the presence of a more general developmental disability (such as mental retardation, often associated with the autism diagnosis). I also briefly describe some perspectives on intervention approaches. By means of introduction, I will discuss perspectives on the assumed role of language in autism and briefly describe components of language in nonclinical populations.

THE ROLE OF LANGUAGE DEFICIT IN AUTISM

Since the identification of autism over 50 years ago, the syndrome has been alternately characterized as reflecting a primary social-interactive [Kanner, 1943; Mundy and Sigman, 1989], linguistic/symbolic [Churchill, 1972; Ricks and Wing, 1975], or cognitive [Rutter, 1983] system disorder. Yet despite extensive theoretical and empirical attention, no individual system has emerged conclusively as the primary underlying source. This difficulty in identifying a single point of origin suggests either that the deficits in autism involve components of multiple systems or that the impairment is at such a basic level within a single system that it influences behaviors from all.

Regardless of which area represents the “primary” source of deficit, characteristic patterns of performance can be identified that differentiate people with autism from peers at similar levels of cognitive development and/or delay. These patterns provide the basis for diagnosis [Lord et al., 1994]. Impairments in language constitute one area of deficit required for autism diagnosis; intact language in someone with other characteristics of autism leads to alternative, albeit related, diagnoses (such as Asperger's syndrome; Lord and Paul, 1997; Lord and Venner, 1992). Of interest is the nature of the language impairment. Is the language of people with autism truly disordered, showing selective deviations from the course and content of normal development? Or is it simply delayed, occurring later but with the same patterns of development once initiated? Research in the last 10 years has begun to focus explicitly on these questions. The resulting descriptions allow initial analysis of which language patterns appear specific to autism and how those patterns resemble or diverge from normative development.

LANGUAGE IN NONCLINICAL POPULATIONS

Language entails four interrelated systems of linguistic communication: pragmatics, semantics, phonology, and syntax. Pragmatics refers to the conventions governing language use within social interactions. These include nonverbal social behaviors such as turn-taking or use of eye contact as well as verbal measures of formality of speech or topic selection. For instance, the types of words one might select and the topics one might introduce when talking to one’s best friend would be very different from those one might select when talking to a prospective employer. Semantics refers to the rules governing word meanings and concepts. Semantic conventions govern our ability to acquire new words and their meanings, to organize our concepts in memory, and to produce or respond to those words during meaningful communication with a partner. Phonology refers to the rules governing production of speech sounds. Phonological conventions include the ways in which we learn to pronounce or articulation of sounds. Subsumed within

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Systems are developing in synchrony. Only useful when all components of the practice of characterizing “language” through relies on abandoning the common practice that all such individuals show observed across individuals with autism constitutes one area of deficit necessary impairment is so fundamental that it speech. Yet, as noted above, language communication to relatively well-developed range from mutism and little functional skills can be selectively impaired gestated that each of the individual language domains can be selectively impaired [Cromer, 1988a,b]. Consequently, it is possible for skills to be relatively advanced in one domain (say, semantics) yet delayed or deviant in another (for instance, syntax). Also possible is for language to be delayed relative to broader intellectual functioning.

LANGUAGE CHARACTERISTICS IN AUTISM

Perhaps the most salient characteristic of language across individuals with autism is its diversity. Language skills range from mutism and little functional communication to relatively well-developed syntactic capabilities and functional speech. Yet, as noted above, language impairment is so fundamental that it constitutes one area of deficit necessary for autism diagnosis. How do we reconcile the heterogeneity of language levels observed across individuals with autism with the syndrome-wide diagnostic criterion that all such individuals show language impairments?

The answer to this question in part relies on abandoning the common practice of characterizing “language” through a single measure. Such an endeavor is only useful when all components of the systems are developing in synchrony. Syndromes such as autism may involve uneven development across domains [cf. Lord and Paul, 1997; Tager-Flusberg, 1989]. The existence of such potentially “splintered” patterns render the practice of measuring a single language level both clinically and theoretically suspect.

A better approach is provided by what has been called language profiling. Here, multiple language skills are assessed and compared with patterns obtained from typically developing youngsters. Constructing an individual profile allows us to characterize patterns of strengths and weaknesses across various domains. The increased recognition of the importance of profiling is demonstrated by the recent publication of a standardized instrument that allows clinicians or researchers to directly compare profiles to a database normed on typically developing children and children with autism [Wetherby and Prizant, 1993]). Considering data on language skills in autism from this “profiling” perspective demonstrates a systematic pattern of impairment, regardless of the actual level of language available to the individual. It is this systematicity of syndrome-specific patterns that is of interest to explore in autism [Mundy and Crowson, 1997]. The following sections describe features of language skills and impairments that have been reported in autism.

Language Use (Pragmatics)

Pragmatics reflects social aspects of language use. Because social interaction is by definition at risk in autism, it is not surprising that peculiar pragmatic patterns are among the most well-established language characteristics. Many behaviors subsumed under pragmatics are social or affective in nature; eye gaze patterns, social smiling, and so forth [see, e.g., Travis and Sigman, this issue; Ungerer, 1989]. Other behaviors reflect constraints on verbal conversation such as turn-taking, choice of topic, and relevance of contributions to conversations. Because pragmatics involve both verbal and nonverbal communication, profiles of skill and weakness in this domain can be recorded regardless of the actual language level of an individual. The existence of pragmatic deficits is therefore common to all individuals with autism, including those who show limited spoken language and those who ultimately acquire speech skills.

Two nonverbal behaviors frequently cited as peculiar in autism are eye gaze patterns and gesture. However, the relevant behaviors are often not wholly absent in children with autism. Because of this finding, Mundy and his colleagues [Mundy and Crowson, 1997; Mundy and Sigman, 1989] pointed out that an understanding of autism requires us to do more than simply count the frequency of any one behavior. Neither frequency nor duration of eye gaze or gesture behaviors alone are sufficiently sensitive to clearly differentiate autistic from nonautistic children [e.g., Mundy et al., 1986]. Instead, the deficit appears when the conversational role of the behavior is considered. When the social context involves either face-to-face social games or goal-oriented requesting, eye gaze and gestural referencing (respectively) appear relatively intact. Only when coordinated attention between a partner and an environmental event is required do individuals with autism show identifiable limitations [Ley and Dawson, 1992; Macarthur and Adamson, 1996; Mundy et al., 1986; Wetherby, 1986].

This widely studied phenomenon of coordinated attention has been labeled “joint attention.” Impairment in joint attention is one of the best-replicated measures distinguishing young children with autism from nonautistic peers [cf. Mundy and Crowson, 1997; see Travis and Sigman, this issue]. The presence of at least some joint attention behaviors also appears to be a reliable prognostic measure of the later emergence of advanced language skills in individuals with autism [Mundy et al., 1990].

Pragmatic difficulties can also be observed in speech-based conversation [e.g., see review by Lord and Paul, 1997]. Turn-taking seems to be at risk, and persistent (perseverative) questioning is characteristic [Hurtig et al., 1982; cf. Prizant and R y dell, 1993]. Immediate and delayed repetition of words or whole phrases, a phenomenon called echolalia, is widely reported [cf. Prizant and Rydell, 1993]. It has also been noted that individuals with autism contribute little new information to conversation, insert irrelevant remarks into conversations or narratives, and have trouble following a partner’s conversational topic [Loveland et al., 1990; Paul and Cohen, 1984; Tager-Flusberg and Anderson, 1991]. Although many such characteristics have also been reported for other language-related disabilities, they appear more frequently and as a greater proportion of speech in autism. All of these behaviors appear to reflect difficulties in applying language for communication purposes.

In summary, there appears to be a syndrome-specific impairment in pragmatic applications of language. The impairment does not affect all language functions globally, however, but instead is selective to certain circumstances. Nonverbal eye gaze or gesture patterns are good examples of behaviors that remain relatively intact for instrumental or purely social communication, but show selective impairment when the context obligates sharing of information.
within “joint attention.” So fundamental is this effect that the degree of impairment in joint attention provides a prognostic index of later language development. In addition, the effect carries over to speech-based communication. Here we see specific impairments in sharing of information, demonstrated when autistic individuals contribute either too little or even irrelevant information or when they use unusual behaviors (echolalia or perseverative questioning) to maintain conversation. These pragmatic difficulties in applying learned skills to functional purposes affect symbolic, phonological, and syntactic behaviors more broadly. The following sections explore each of these domains.

Symbolic Behavior (Semantics)

Children with autism show some clearly unusual word-related behaviors. Most common are “metaphorical” and idiosyncratic language, including the use of unusual but meaningful words or phrases (“cuts and bluesers” for “cuts and bruises,” Lord and Paul, 1997), made-up or nonsense words (neologisms), or imitation of words or phrases that are not necessarily appropriate to the current production context (echolalia; see Prizant and R ydell, 1993; Prizant et al., 1997). All three types of peculiar patterns were noted as part of the original description of the syndrome (K anner, 1943). Are these unusual lexical patterns specific to autism? Each has also been reported in very early typical language learning [Bloom and Lahey, 1978] or nonautism disorders [Yule and Rut- ter, 1987]. The simple occurrence of these behaviors is not limited strictly to autism. Yet all three behaviors are especially prevalent in autism, particularly echolalia [Volden and Lord, 1991], and neologisms least so. Further, the behaviors persist well beyond the early stages of development. Therefore, speech in autism may be distinguished by a heightened frequency and persistence of these semantic oddities.

Do the patterns represent selective deviances in abstract symbolic/conceptual functioning? While some theorists have answered in the affirmative [Fay and Schuler, 1980], this perspective is challenged by recent studies. Children with autism demonstrate capabilities commensurate with language-matched peers with developmental disabilities (as well as typical peers) on measures of category-based sorting, naming of categories and category members, and vocabulary tests (Boucher, 1988; Tager-Flusberg, 1985a,b). Many individuals with autism who acquire spoken language may acquire large vocabularies and perform well on formal measures [cf. Lord and Paul, 1997; Jarrold et al., 1997]. It has been argued, therefore, that at least some of the symbolic problems reflect application of the concepts for communicative behavior rather than a selective symbolic deficit [Tager-Flusberg, 1986; Ungerer and Sigman, 1987].

In addition to the unusual word use patterns, the onset of word learning in development can be delayed [Lord et al., 1994]. Such delays are reported for other developmental disabilities and thus their presence alone could not be considered syndrome-specific. Yet vocabulary acquisition may represent a unique challenge in autism due to the relation of pragmatic factors to semantic development. As noted previously, the pragmatic function of joint attention seems to be at particular risk in autism. Joint attention is considered to be one of perhaps several mechanisms facilitating vocabulary growth in typical development [Bruner, 1983; Dunham et al., 1993]. If joint attention is impaired, it is reasonable...

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and thus, perhaps, greater linguistic sophistication than pure imitation [Paccia and Curcio, 1982; Prizant, 1983]. The role and informativeness of prosody in echolalia remains an important potential avenue to explore [Prizant and R ydell, 1993].

The developmental course of phonology and prosody in autism is also striking, if not yet fully understood. Very little is known about whether early acquisition follows normative patterns. One problem is that the underpinnings of phonology/prosody are established during babbling in the first year of life, before autism is suspected. Prospective studies of babbling in youngsters who might be later diagnosed as autistic are virtually impossible. Some recent studies have suggested that there may be some unusual features of both speech sound acquisition as well as early prosody [e.g., see Lord and Paul, 1997; Lord et al., 1994]. Once spoken language is acquired, atypical prosody remains evident throughout the lifespan [see Baltaxe and Simmons, 1985]. Unlike other language domains, improvement in prosodic skill does not seem to occur even when other language skills show marked advances.

To summarize, phonological aspects of language appear to be relatively intact in structure. The striking exception concerns the prosodic features that overlay onto speech during conversation. Prosody is of interest because it carries social nuances above and beyond the formal articulation, and thus might be considered part of the functional applications of phonology. It may be that prosody will be able to provide insights into levels of linguistic comprehension in echolalic utterances, although such analyses remain to be completed. Also not fully understood is the path of phonological and prosodic development.

Syntactic Skills

Like the other language domains, the syntax of individuals with autism is characterized by patterns of skill versus atypicalities. Overall, the syntactic levels of individuals with spoken language do not appear to be delayed relative to other language domains, or relative to nonautistic peers with developmental delays. In addition, development does not seem to diverge from normative patterns [e.g., see Tager-Flusberg, 1994; Tager-Flusberg et al., 1990]. These conclusions were supported by a recent study profiling performance by autistic children on a set of standardized language measures [Jarrold et al., 1997]. The study compared performances on standardized tests of receptive and expressive vocabulary and syntactic structure. Individuals with autism showed no specific deficits in syntax relative to other individuals with developmental disabilities. Yet a variety of specific features have been described in the speech of individuals with autism. Particularly salient are the reversal of pronouns (saying "you" for "me," and vice versa), echolalic speech (that is, repetition of words or whole phrases) and the conversational features already noted in the section on pragmatics (e.g., topic maintenance and information sharing).

Pronoun reversal has been noted repeatedly since Kanner's [1943] first description of autism [Bartak et al., 1975; see Lord et al., 1994]. Because pronoun reversal is reported almost exclusively for autism, it can be considered syndrome-specific. The root cause of pronoun reversal has been difficult to pinpoint, however. It does not appear to reflect a problem with the structural category of agency; proper nouns such as names are typically employed accurately. Nor does it appear to reflect problems with grammatical structure; autistic individuals make few errors in case markings for personal pronouns (not confusing "me" versus "my"); see Tager-Flusberg, 1994). One explanation is that the difficulty lies in comprehending the "shifting" of pronouns, which change in meaning depending on who the speaker is. For instance, the person referred to in the sentence "mommy wants a cookie" is always constant (mommy). In the sentence "you want a cookie," however, the person referenced is relative to whether the speaker is the child or the mother. However, a study explicitly designed to explore understanding and production of personal pronouns did not find the expected differences between autistic and nonautistic groups [Lee et al., 1994]. When asked about who was pictured in photographs, children with autism showed comprehension of the references of personal pronouns similar to nonautistic peers with developmental disabilities. In production tests, autistic participants often substituted proper nouns for pronouns, but did not show errors in pronoun use.

How do we reconcile the widespread observation of reversal of pronouns in speech with the skills demonstrated in formal tests of pronoun reference? The ability of individuals with autism to identify referents for personal pronouns in testing suggests that the problem may not lie in the ability to conceptualize the "shifting" role of personal pronouns. Instead, it may be necessary to explore the conversational environment in which personal pronouns are applied. Lee and colleagues [1994] suggested that the problems may be rooted in social usage patterns. Their formal testing situation may have elicited skills that are somehow vulnerable within a social or conversational context. Perhaps, again, the pattern of atypicality may reflect problems in applying a formal skill to actual functional communication.

Echolalia can also be considered within the syntactic functioning of individuals with autism. Echolalic production of phrases involves repetition of what may be "unanalyzed" blocks of language. Repetition of the sentence "Do you want a cookie?" retains an accurate syntactic structure; however, its meaning does not appear to have been analyzed on a word-by-word basis [Prizant, 1983]. The prevalence of such unanalyzed blocks has led to speculation that syntactic development in autism may take a different course from that of other language learners [Simon, 1975]. Perhaps echolalic individuals do not progress through the typical stages, building from one-word to two-word utterances, as a means of achieving grammatical competence. This proposal has been challenged by one of the only longitudinal analyses of syntactic development in autism [Tager-Flusberg et al., 1990]. Development of non-echoed speech in children with autism proceeded similarly to that of matched peers with Down syndrome. It is possible that echolalia can serve as a means for the individual to maintain blocks of speech in memory for later analysis [Prizant and Rydell, 1993]; however, presence of echolalia does not appear to alter the typical course of acquisition of spontaneous syntactic structure [Tager-Flusberg et al., 1990].

In summary, the patterns in syntax are consistent with the patterns noted for other domains. Comprehension of personal pronouns seem to be intact in individuals with autism, even though personal pronouns are frequently reversed during actual speech. This suggests that the problem lies in the application of the pronouns during conversation, rather than the ability to conceptualize pronoun reference. The development of the forms of syntax do not seem deviant or even delayed relative to other developmental disabilities (although often delayed relative to typical chronology). This is true despite the frequent observation of repetition of rote, unanalyzed blocks (echolalia). These findings suggest that echolalia serves a functional role, rather than being
Summary: A Pattern of Impairment in Language

The pattern of impairment that appears to be emerging for language in autism involves a dissociation of form (language structure) and function (language use) [Tager-Flusberg, 1989, 1994]. In all four language domains, the forms by which language is expressed remain relatively unimpaired, but the functions of language show significant disturbances.

Even at the most basic level of nonverbal communication the form/function dissociation is observed. The forms are the actual behaviors: eye gaze and gestural referencing. Appropriate (if delayed) production of both forms can be observed under social or instrumental communication conditions. Impairment appears when the forms are applied to the function of joint sharing of reference, however. Consider further the patterns of semantic skills. The relative skills in the semantic domain include delayed but successful acquisition of word meanings (either conventional or idiosyncratic), grouping of those meanings into categories, and category labeling. Each reflects the ability to acquire and organize conceptual structures that undergird semantics. All these skills reflect the formal or structural components of word meaning; they can be accomplished without reference to the context of communicative use. Yet words have communicative value because they allow individuals to share information. To do this, there must be agreement about the word meanings between a speaker and listener (and the larger community). For instance, in English we adhere to the convention that the combination of the sounds “d” and “o” and “g” refers to one type of animal (“dog”). There is no inherent reason why this combination of sounds should refer to these animals; among French speakers the equally satisfactory conventional sound combination is “chien.” Only by adhering to socially determined conventions can mutual understanding between speakers be achieved. Neologisms and metaphorical language both refer to word forms whose meaning is idiosyncratic, or made up by the autistic individual. While they demonstrate the formal properties of word meaning (each word represents a specific concept), they diverge from the social conventions governing application of meaning for communication purposes. Thus, these peculiarities in semantic behavior may be traced to deficits in functional application of the language form.

Similar form/function dissociations can be analyzed within phonology and syntax. In phonology, the formal structure of articulation and perception appear relatively intact. The deviations appear in prosody, which carries social and affective nuances of speech during interaction [Baltaxe and Simmons, 1985]. Again, in syntax the structures of language often are not deviant from normative patterns. Rather, we see specific difficulties in applying the structures within interactions. For instance, accurate syntax often is produced even while problems arise in the appropriateness of utterances to conversational topics, addition of information, or contingency of responses (discussed under the section on pragmatics). Even the hallmark pronoun reversal appears to be a selective impairment in the functional application of the terms. Lee and colleagues [1994] study suggested that the concepts of personal pronouns are comprehended and accurately produced in formal testing; yet we still see the remarkable reversals during social conversations.

Can the form/function analysis account for all the characteristics of language in autism? Given its promise, it seems reasonable to explore this question in detail. Echolalia is one area where such an analysis may be productive. It appears that echolalia may represent the application of syntactically and prosodically accurate language blocks to communicative functions [Prizant and Rydell, 1993]. Thus, in echolalia the relative strength with forms may assist in the more challenging realm of functional application. However, this perspective is controversial and will likely remain so until definitions of echolalia and perspectives on its function within autism are better understood [Prizant and Rydell, 1993]. Another characteristic behavior is the use of a partner’s body to communicate (for instance, placing mother’s hand on a desired item [Lord et al., 1994]). How such a specific pattern fits within the analysis of autism remains to be determined. Finally, it has been suggested that regression of vocabulary occurs early in development in about one-third of children with autism; they either show deceleration of the rate of learning new words, or lose use of already-learned words [Brown and Prelock, 1995; Kurita, 1985]. The reasons for this remain perplexing. Recent models may be well suited to explaining it [for instance, see Mundy and Crowson, 1997], but these models are still in the early stages. As profiling of both the formal and the functional skills of individuals with autism becomes ever more sophisticated, we come closer to resolving these questions.

PROGNOSIS AND LANGUAGE INTERVENTIONS IN AUTISM

Many interventions have been implemented in autism, and the best practices remain highly controversial. Intervention is complicated in this population by several factors: 1) the diversity of language skills and skill levels demonstrated by individuals with autism, 2) the difficulty in early diagnosis and in predicting which members of the population will develop advanced language, and 3) the concomitant diagnosis of mental retardation in the majority of individuals with autism diagnosis.

Because autism is best characterized by profiles of skills together with specific atypicalities, interventions designed to accelerate global development may not be preferred. Only recently has the value of systematic profiles of language skills been appreciated and made accessible for research and clinical use [Wetherby and Prizant, 1993]. The information made available from these profiles may allow interventionists to target the areas in which intervention is most necessary. Profiling has also allowed greater precision in identifying who will be likely to develop language or other adaptive and intellectual skills, although we are still at the early stages. As noted, better joint attention skills are a positive prognosis for later language development [Mundy et al., 1990]. Production of speech before age 5 has also been related to later advanced development in language and other intellectual domains [Lord and Paul, 1997; Ventner et al., 1992].
Early intervention approaches to autism include a range, from discrete-trial behavioral approaches [Lasky et al., 1988; Lovaas, 1987] to structured naturalistic strategies [see Prizant et al., 1997; Schuler et al., 1997; Wetherby, 1986]. Procedures that use intensive, trial-by-trial training may take advantage of the responsiveness of children with autism to structure. This intensive early intervention approach has reported striking success in outcomes [Lovaas, 1987]. However, opponents of this approach argue that the targeted social skills should be those that are child-initiated and functional; thus, behavioral interventions that are adult-directed are counterproductive to the needs of children with autism [Wetherby, 1986]. There remains considerable debate over the relative virtues of either approach, which will only be resolved with systematic research.

CONCLUSION

The study of language in autism is a complex endeavor because of the diversity of language skills presented by members of the population. Specific patterns of skill and impairment have been reported in each of the domains of language. At first, these patterns may appear to reflect unrelated or scattered deviances. Using a profiling approach, however, a systematic pattern appears to be emerging. This pattern is one of dissociation of form, or structures of language, and function, or application of the forms. As we explore language profiles in greater detail, it may be that we can explain each of the impairments noted for autism by examining the contexts constraining language use.

REFERENCES


