MESSAGE ORGANIZATION IN AUTISM SPECTRUM DISORDER

Jessica de Villiers  
*University of British Columbia*  

Peter Szatmari  
*McMaster University*

**Autism Spectrum Disorder (ASD)** is a neuropsychiatric developmental disorder characterized by core impairments in social communication, especially in spoken discourse. Individuals with ASD fail to develop basic social skills. There are various diagnoses along the spectrum, the milder of which are most often diagnosed as Asperger’s Syndrome. From mild to severe, social communication impairment is a shared trait across the spectrum. Considerable knowledge has been gained in categorizing the various communication breakdowns that make up these impairments but as yet, little is known about why they occur. A common impairment is in the area of message organization.

There are several theories of ASD, with at least one specifically addressing social communication impairments, but none deal with all the difficulties in ASD communication. In particular, none of the theories deal with the problems related to information structure and message organization which, it is suggested, are a commonality in the autism spectrum. This paper brings a linguistic perspective to the question of social reciprocity in ASD and considers two observable and consistent patterns of social communication impairment, both related to message organization. The patterns observed are discussed in terms of a more global theory of model building and conceptual integration and a link is made between predictable patterns of linguistic behaviour in ASD and a pattern of single inheritance relations between instances and models. While the scope of this paper is limited to a discussion of two aspects of communication impairment, these are seen to be part of a larger overall pattern in ASD communication.

On a constant basis, our brains are engaged in processing information, available through the senses, including selecting some of the information from the multitude available, and constructing models depending on situations and context. In this way we are able to build models of generic situation. And these models are what we use to make sense of and communicate in the world around us. The models we create can be combined to make new models and we can extrapolate from the models we have—our knowledge of generic situations—to make interpretations about new situations. It’s a way to process information quickly.

It is impressive that for most situations people are faced with every day, we can find a model that we can use to understand and cope with the context that is being presented to us. And while we are building these models to reflect our contexts all the time, we are also changing our models all the time. But it is remarkable also that there are people who are not building models in this way—people who have a different approach to model building. This is the case in Autism Spectrum Disorder.

1. Theories of Autism Spectrum Disorder. The theories of ASD that are widely known address some of the communication impairments associated with ASD, each slightly differently. Theory of Mind (hereafter ToM)—the theory that people with autism and related disorders cannot recognize that other people have mental states different from their own—handles many of the social communication impairments (Baron-Cohen 1995 passim). In particular ToM answers the difficulties people with ASD have with mind-reading and literalness and some of the pragmatic misunderstandings people with ASD experience. But ToM does not address the problems in model building.

The theory of Weak Central Coherence (hereafter WCC) describes the processing style of people with ASD (Frith 1989). With this theory, there is featural as opposed to global processing. Featural processing helps with an understanding of processing information and how people take things in in pieces. Certainly WCC theory plays nicely in terms of how we use and process bits and pieces to make models. It also directs us toward thinking about how we have different planes of models. But WCC theory does not address what this means for the communication of individuals with ASD, and it has rarely been directed toward social communication, as ToM has. WCC theory is a basically cognitive approach, and it has mostly been applied to explain certain cognitive findings in ASD, like the capacity of those with ASD for certain tasks, special skills and repetitive activities.

2. Impairments in Social Communication in ASD. A defining characteristic of ASD is impairment in communication skills. The diagnostic criteria and instruments focus on the areas of communication behaviour and reciprocal social interaction, both of which concern language. The remaining diagnostic area, stereotyped interests and behaviours, also includes communication, incorporating stereotyped language.

Figure 1 indicates the role of communication in a diagnosis for ASDs. There is often language delay or a lack of development of spoken language, but even where an individual is speaking in sentences, there are problems in spoken conversation and social

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*(Figure 1. Communication-related DSM-IV criteria for ASD.)*

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(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 impairment in 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

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discourse. One of the most striking things about the discourse of ASD is the variety of impairments found. The patterns of impairment in the spoken discourse of individuals with this disorder range from sounding like a sportscaster (pedantic speech), to topic inflexibility or flexibility (semantic drift). There can be problems with quantity of information (terseness and perseveration) relative to topic or situation. Often there are atypicalities in the rhythm and intonational patterns (de Villiers et al., forthcoming). Another notable pattern is that of chronological or serial organization.

The variance in the communication impairments of ASD is immediately observable and generally accepted—there is a varied profile in the discourse patterns of this disorder. What may be less obvious is that the patterns vary in predictable ways, and this predictability can be seen through a more delicate analysis. Moreover, when the problems in communication are considered in terms of a more comprehensive pattern of conceptual integration, they all fit a similar pattern. Occurring throughout the spectrum of autism, there is a lack of complexity, or connectivity, between the different areas of language.

Two highly predictable patterns will be considered in terms of their relationship to model building and conceptual integration: chronological or serial organization and prosodic impairment.

3. CHRONOLOGICAL ORGANIZATION. The following textual examples from three different subjects display the characteristic chronological pattern of organization (specifically, theme-subject repetition substituting for anaphora, combined with a temporal sequencing).

In (1), quantity of information and linearity are both a problem. The larger story it is taken from is delivered in the same, chronologically ordered pattern. In fact, the story is so linear from start to finish that the plotline is very difficult to follow. All details are related as bits in serial. And the speaker never pauses in the course of the story to summarize or even state the point of the story (e.g. ‘you know, it took so long for that train to arrive’).

The pattern of full subject + predicate is evident and the repetition of full subject (‘the yellowish going north’) in place of other pronominal anaphora lends an interpretation of new information where given would be called for.

(1) *CHI: and I saw the yellowish going south at Bloor on the other side.
CHI: and the yellowish going north came.
CHI: and I saw the yellowish going south through the windows of the yellowish going north.
CHI: and I got in the yellowish going north.
CHI: and then the yellowish going north left from there.
CHI: then the yellowish going north went out into the tunnel the yellowish going north in the Rosedale.
In (2), the boy with Asperger’s Syndrome is asked where he works. In a similar pattern, he provides a series of events connected in serial order and represented with a series of additive conjunctions, temporal markers and a full subject + predicate pattern.

(2) EXP: so you travel from here to there?
    CHI: yes.
    EXP: oh really?
    EXP: <that’s> [>] quite a trip.
    CHI: <yeah> [<>].
    CHI: uh ye yeah it is quite a trip.
    CHI: we go on the van first.
    CHI: and then and then we then we work # then we work um something like uh nine-thirty to nine-thirty to twelve [!].
    CHI: then we have lunch at twelve at that.
    CHI: then we start back at work at one o’clock.
    CHI: and then we go right all the way through to four-thirty.
    EXP: oh :-.
    EXP: and what time does that get you back here?
    CHI: well we take the um four-forty-five bus…

In (3), a boy with Asperger’s Syndrome is asked what he had for supper. The example follows a similar pattern again, but with some ellipsis toward the end of the recipe. Interestingly, where there is agent and agent+predicate ellipsis (lines [12]–[14], in bold), there is a more pronounced pedantic quality.

(3) [1] CHI: pork and rice casserole.
    [2] EXP: oh that sounds good!
    [7] CHI: um :- then you put the uh # rice in first.
    [8] CHI: then you put the porkchops on top of the rice.
    [9] EXP: uhhuh?
    [10] CHI: then you uh # sprinkle two packets of onion soup mix on top.
    [12] CHI: and then pour that over all.
    [13] CHI: and then # cook it covered for one hour.
    [14] CHI: and then uncovered for fifteen minutes.
    [15] CHI: and then it’s ready.
    [16] EXP: it sounds very :-: good.
The patterns of serial organization can be related to Van Dijk’s macrostructures, and other theories that consider how people construct global semantic categories to organize and reduce complex information (e.g. Hasan’s [1989] generic structure potentials or Gregory’s [1988] generic structure schemas). People with ASD have problems constructing gists or global meanings so that with ASD there is no abstraction from the detail to construct conceptually more general linguistic representations. In his work on macrostructures, Van Dijk (1980:147) writes that ‘without this level of semantic or information mapping, what you [would] only have is numerous links between all the information units at the local level’. And this is in fact the pattern that can be seen in the sequences of actions described in the above chronologically organized texts. In each case there are serial ordered relationships (elements related in chains), and problems with quantity of information relative to situation. What is lacking is generic structure.

An explanation can be put forward of single inheritance relations (Hudson 1990, Asp 1997). In ASD the processing happens in discrete bits. There is a bias toward detail-oriented information processing and information is not pulled together in the usual ways, to give a more global category. Incorporating the notion of inheritance relations, typically the integration process we have in our higher order information processing involves inheriting properties from multiple models, but with ASD there is a pattern of single inheritances. They are not inheriting from multiple domains—the models of inheritance are isolates. Rather than abstracting from the details to form prototypes and build conceptual models, with ASD, the instances perpetually override the relevant models. Another way to look at this is in terms of generalization. People with ASD have trouble recognizing generic conventions, so they have problems with generic structure.

4. PROSODIC IMPAIRMENTS. The second predictable linguistic pattern to be considered is prosodic impairment. The language of ASD is often associated with an atypical intonational pattern, in which prosody and pitch are unvaried and wooden. In various scales and diagnostic criteria, the intonational patterns of people with ASD are identified as atypical, both in terms of a characteristic flat or choppy intonational quality and in the placement of contextually unsupported or unexpected phonological stress. (de Villiers et. al., forthcoming). An alternative perspective is offered here, where the intonational patterns are recognized, not in terms of their degree of typicality or atypicality from the norm, but in terms of the degree of complexity in the intonation system. Languages have their own rhythmic pattern. And individuals develop their own, very individual rhythmic patterns in speech as well. But despite the fact that we have such personal rhythm patterns—even things like speed are part of this—we accept each other as unimpaired or typical, to a certain extent.

With ASD, the registering of associations is not the same. The pattern of single inheritances gives problems with assigning relevance to intended significant linguistic contrasts according to different situations and audiences. As a consequence, the relevant contrasts between rhythmic patterns and contexts are not made. Instead, what is often found in ASD is a characteristic flat, staccato pattern of intonation. It is a
pattern that does not change with context, likely because the individual has not registered the changes in context. So it’s simplified. This is what people are responding to when they notice the flat, sometimes choppy, intonation pattern in ASD—not so much atypicality, but a lack of complexity in the system. The rhythmic and intonation patterns have less variety than speakers typically include.

This principle of a lack of variety or complexity can be posited throughout the linguistic system. Not only does intonation penetrate the entire linguistic system, but it may be that the lack of development seen in the intonation system can explain difficulties in other areas of the grammar as well. To take an example, in ASD there are problems with turn-taking and length of turn. In particular, people with ASD are often considered terse, providing polar responses with no supplementary information. Interactionally, the expected rhythmic patterns of exchange are not linked to their contexts. For most speakers, there are patterns of rhythmic response and exchange that a person needs to follow to be responsive within a particular context. But if people are not integrating the relevant intonation patterns and contrasts with context, and in particular if the models of inheritance are single models, then there may not be a recognition of the need for rhythm and response in certain situations and there may also be an inflexibility in their patterns of response in particular contexts.

In terms of the pragmatic difficulties people with ASD face as well, there are problems with relating instances to generic structure. Thus people with ASD invariably access the wrong generic situation, particularly where there is ambiguous linguistic representation. In ASD, there are single (as opposed to multiple) inheritance models, so there are single correspondences between generic situations and their linguistic expressions. Expressions are used repetitively, but not generalized to new instances. One of the effects of this is stereotyped or formulaic sounding language.

5. Implications.

5.i. Cognition. In looking at how these linguistic patterns relate to cognition, what they suggest is that there may be a lack of integration in ASD. In cognitive terms, there may be access to different domains but no transferability, and in some cases there may be imbalances in access. The neural work is just starting to inform the relationship of neuronal activity to language related difficulties, but the lack of complexity seen in the predictable prosodic and pragmatic information structuring patterns suggests that people with ASD may lack the connectivity to be able to sort and link patterns of instances together to make or relate higher-level categories. This explanation may tell us about disparate impairments in ASD. It has a fit with the special interests associated with Asperger’s Syndrome, and has implications for perseveration and special capacities. It fits too with current work on attention where people with ASD have trouble shifting their focus from one focal point to another or dividing their attention between two fields.

In terms of the other characteristic linguistic patterns of ASD, the explanation is similarly integrative in that it may speak to all of the impairments in social reciprocity and communication associated with the disorder. That is, seen in this light, it is

possible that the social communication impairments in ASD represent compensatory techniques for a limited range in realizing generic structure. It may be that chronological, serial organization is substituting for generic structure or represents a limited repertoire for generic structure. Similarly, with pedantic speech and perseveration, it may be that the use of factual (expert) information, and the use of stereotyped language or linguistic formulas (cultural linguistic patterns that reflect how people typically talk about these things) are substitutes for, or elements of, generic structure.

5.2. Treatment. The concept of a limited repertoire in the communication of people with ASD has treatment implications. There are currently no adequate interventions for conversation skills for people with ASD. Most people agree ToM cannot be taught. Yet social communication impairments are an important area for remediation, greatly impacting quality of life. If even some of the problems seen in ASD communication are linked to a limited repertoire, it points in a useful direction—increase the repertoire.

By working toward increasing the variety of intonation patterns that can be used with particular expressions in particular contexts, it may be possible for people with ASD to develop their rhythm patterns and to operate with an increased level of variety. By working toward flexibility and against the fixed routine, building along the line that there is always an alternative, it may be possible for individuals with ASD to improve their facility for hearing and repeating different patterns and rhythms of speech (according to different situations and audiences). Whether this could be generalized is an important question, but the increased repertoire itself might help them to fit in.

¹ For a current review of the major theories of autism see Frith 2003.

² ToM is certainly aimed at accounting for social communication problems, but there are predictable patterns in ASD communication that this theory does not account for, such as message organization.

³ Symbols follow CHAT conventions of the CHILDES language data exchange system:

- EXP = experimenter
- CHI = child
- [>] = overlaps with following text
- [<] = overlaps with preceding text
- [!] = marked stress
- # = pause
- -: = syllable lengthened

REFERENCES.


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