

# **Autism and Pragmatics of Language**

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## **Abstract**

This paper describes different aspects of Autism and attempts to explain the syndrome using the theoretical framework of Modular Pragmatics of Language. We review definitions and classifications of the disorder from the first description of the syndrome by Kanner (1943), through the Theory of Mind (Leslie, 1987) interpretation of the core impairments in Autism, to the most recent DSM-IV (Volkmar et al., 1994) classification.

We present in this paper the point of view of Pragmatics of Language, based on the theoretical model of Kasher (1991), under which the autistic core impairments are analysed in terms of the knowledge required for the various pragmatic areas. This theoretical framework can account for the core deficits of Autism as presented in the DSM-IV (1994). The analysis is illustrated by clinical cases.

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## 1. Introduction

Autism is a syndrome in which not all of the symptoms need to be present in each case. The group of autistic individuals is highly heterogenic, thus posing many problems in the definition and classification of the disorder. It is increasingly accepted today that there may be a wide spectrum of autistic disorders, ranging over various variations of Autism, that manifest themselves with different degrees of severity. Autistic individuals suffer from a circumscribed brain abnormality that affects development from birth; as such, it is a disorder for life. The basis of the handicap is a specific cognitive disorder that has been identified as a deficit in intentionality and reasoning about other minds, with other aspects of their cognition relatively spared (Baron-Cohen, Leslie & Frith 1985, Frith 1989, Happé 1993, Baron-Cohen, Tager-Flusberg & Cohen 1993). Autistic individuals also show deficits in using direction of eye gaze and in interpreting nonliteral intentional language such as jokes, sarcasm and irony (Happé 1991, 1993). Baron-Cohen (1994) has concluded that in Autism, theory of mind and pragmatics of language are impaired, while syntax and face processing are relatively intact. However, most references to the impairments in pragmatics of language in the literature are not supported by a clear and broad enough theory that can account for the deficits in Autism.

In this paper we present a theoretical framework of Modular Pragmatics of Language that can account for the core deficits of Autism.

## 2. Review of the literature

The word Autism is used for the distinctive developmental disorder that is often called “early infantile autism” or “early childhood autism”. Historically the term has been used in a broad range of contexts and as a consequence Autism has been interpreted in various ways. The following examples illustrate some of the different interpretations of the term Autism in the literature:

1. The Webster dictionary defines Autism as “a state of mind characterized by daydreaming hallucinations, and disregard of external reality”.
2. According to the Encyclopedia Britannica, Autism manifests itself as

**a symptom of Psychosis in disorders of thinking:** “In autistic or dereistic thinking the mind appears to operate without regard to reality, building up an unrealistic fantasy life and becoming preoccupied with the fantasy to the exclusion of reality”.

**a defense mechanism:** “Autism - withdrawal into fantasy and regression (a moving back towards less mature but more comfortable levels of personality development) and protective devices but may lead to psychosis formation”.

**related to schizophrenia:** Bleuler referred to the disordered thinking of schizophrenics as being “autistic or dereistic”.

**related to wolf-children:** B. Bettelheim showed that the behavior of emotionally damaged autistic children - children so damaged that they do not talk and fail to relate to others - matches the described behavior of the wolf-children. This provided a rationale for their strange behaviors.

3. Donna Williams, an autistic woman, has described in an exceptional way her own experience as an autistic person and her understanding of other autistic individuals she had met. In her remarkable second book she writes: “Autism is just an information-processing problem that controls who I appear to be. Autism tries to stop me from being free to be myself. Autism tries to rob me of my life, of friendship, of caring, of sharing, of showing interest, of using my intelligence, of being affected ... it tries to bury me alive”. (Williams 1994, p. 234)

The condition of Autism was first described by Leo Kanner in 1943. Although fifty years have elapsed and many publications have appeared in the literature, Kanner's original reports provide the most insightful description of the behavioral characteristics of Autism. Based on the developmental histories of 11 children, that did not seem to fit any known diagnostic category at that time, Kanner noted that the essential feature pathognomic to the syndrome, was the inability, starting from birth, to relate to people and situations. Other core characteristics described by Kanner include the failure to assume an anticipatory posture in preparation for being picked up, the failure to use language to convey meaning to others, excellent rote memory, insistence on the maintenance of sameness, good relation to objects and good cognitive potentialities. Kanner noted that the condition of Autism differed from previously reported instances of childhood schizophrenia in respect to the age of onset and postulated that the eleven children had “come into the world with innate inability to form the usual biologically provided affective contact with people, just as other children come into the world with innate physical or intellectual handicaps” (p. 250). Historically, it is interesting to note that in 1971 Kanner argued in a review study for two cardinal features that remained in adult Autism:

1. The “extreme autistic aloneness” characterized by the inability to relate to people and situations;
2. The insistence on sameness, manifested by repetitive movements, ritualistic behaviors, abnormal preoccupations and resistance to change.

The first revision in diagnostic criteria for Autism was made in 1980, whereby the term “infantile Autism” was included in the DSM-III, classified as a “pervasive developmental disorder”, replacing its previous status as a subclass of childhood schizophrenia, which was classified in turn a subclass of psychosis. According to Baltaxe & Simmons (1975) it

is possible to describe six broad categories as the cardinal features of the syndrome of Autism:

1. Impairment of interpersonal relationships characterized by aloofness, decreased physical contact and lack of eye contact;
2. Deficits in social behavior seen in severe limitations in cooperative play, toy play and self-care skills;
3. Stereotyped activities including self-stimulatory behavior, various kinds of repetitions and preoccupation with sameness;
4. Impairment of intellect manifested by concreteness of thought, school performance deficits and difficulties with judgment and abstract thinking;
5. Disturbances of speech and language seen in various forms such as mutism, echolalic speech, delayed development and a variety of other idiosyncrasies in word usage, speech modulation and content;
6. Onset prior to the age of 30 months. (Baltaxe & Simmons 1975, p. 439)

The above represent also the consensus of the National Society for Autistic Children for the behavioral definition of the autistic syndrome. (Ritvo & Freeman, 1978). These researchers reported that 60% of autistic children have measured IQ below 50 and 20% have IQ scores between 50 and 70, indicating that Autism and mental retardation co-exist in the majority of cases. However, they noted that autistic children perform most poorly on tasks that involve abstract reasoning and symbolic or sequential information and best on tasks that involve visuospatial skills and rote memory. Thus, autistic children display a scattered profile of development which can be differentiated from mental retardation.

The incidence of the most classical form of Autism is 4-5 in 10000 births, and there are three times as many males with Autism as females.

In DSM-III-R (1987), the criteria for autistic disorder were broadened to encompass developmental changes in syndrome expression. The criteria presented in this manual are more detailed and drop age of onset as a necessary diagnostic feature. The International Classification of Diseases (10th edition (ICD-10)), that appeared at that time, differed both in the class of disorders included as pervasive developmental disorders and in the criteria used in the definition of Autism. Three other disorders that the ICD-10 included in the class of pervasive developmental disorders were:

**Rett syndrome** - a condition observed only in females, characterized by a brief autistic-like period but otherwise involving features seen less frequently with Autism, such as onset in the first months of life associated with decelerated head growth, loss of purposeful hand movements and severe psycho-motor retardation.

**Childhood disintegrative disorder** - the development proceeds normally for several years, but there is a subsequent marked regression in skills in multiple areas, accompanied by the emergence of various autistic-like features.

**Asperger syndrome** - its major difference from Autism is the greater preservation of language skills with abnormalities in the area of pragmatics. Lack of nonverbal expressiveness, impression of clumsiness and unusual “special” interests which are narrow and private (Tantam, 1988). Since abnormalities are mild enough to be disregarded in childhood, the diagnosis is often sought for the first time during adolescence. Asperger's first description of the syndrome stressed social abnormalities as opposed to speech abnormalities. Two large descriptive studies carried out later (Newsom, Dawson & Everard 1983, Tantam 1991) showed that what Asperger observed as social abnormalities are actually pragmatic ones. Tantam (1986) found in her study that 67% of the subjects affected by Asperger syndrome showed pragmatic abnormalities. The abnormalities tested were choice of topic, failure to respond to social conventions (e. g., calling the doctor by his name across a crowded room at a first meeting), abnormal nonverbal communication described as odd posture, lack of expressiveness, unusual clothes and unusual prosody.

A field trial for autistic disorder recently undertaken towards the development of DSM-IV found that the DSM-III-R definition of Autism is overly broad (Volkmar et al., 1994). The proposed ICD-10 definition was found to be the best overall for Autism. Modifications of the ICD-10 definition of Autism and related disorders produced a more concise and efficient criterion set that allowed convergence of the DSM-IV and ICD-10 definitions.

Recent research in Autism has been organized around the following three core features of Autism. These features have been shown to be relatively independent of intellectual abilities and acquired skills (Wing & Gould 1979):

- 1. Impairment in socialization** - a specific impairment in the quality of reciprocal interactions. Wing & Gould (1979) tried to characterize the social impairment observed in young autistic children. They found that the lower the IQ, the higher the proportion of children affected by social impairment. Wing & Gould (1979) attempted to classify the social impairment and described three types of children: the *aloof*, the *passive* and the *odd*. The distribution of these three types of social impairment among children before age seven was such that about half were aloof and the other half was evenly distributed between passive and odd. In a follow-up study many children had changed the quality of their social impairment and many had lost their aloofness. Since the social impairment aspect of Autism is developmental, it seems plausible to us that the children had acquired some pragmatic social skills that were manifested behaviorally in their social performance.

**2. Impairment in language** - range from failure to develop any language (mute) to the use of language with impairment at different levels. While it is now widely accepted that pragmatics is the most disturbed in Autism, it is still prevalent in the literature to describe it as a communication impairment (Fay & Schuler 1980, Shopler & Mesibov 1985, Rapin 1991).

**3. Impairment in imagination** - a lack of spontaneous pretend play. (Wing & Gould, 1979).

Is there a theory that could explain the co-occurrence of these three deficits?

Research into the nature of the social deficit in Autism has been greatly helped by the recent work on the normal development of social competence, and specifically the development of the so called “theory of mind”. The hypothesis is that autistic children have a specific problem with mental representations and do not develop the ability to mind-read. The inability to form meta-representations and the consequent inability to reflect on the mental states of self and others would have far reaching effects on behavior. The triad of impairment seen in Autism could be due to the inability to mind-read (Frith et al., 1991): the inability to pretend generated the model (Leslie 1987), the social impairment would follow from the lack of a theory of mind and the characteristic communicative impairment would follow from an inability to represent intentions or recognize utterances as interpretations of the speaker's thoughts (Frith 1989). Baron-Cohen, Leslie & Frith (1985) tested the hypothesis that autistic children lack a theory of mind. They tested twenty autistic children with MA's well over four years using the Sally-Anne task test. Wimmer & Perner (1983) developed this test to show that from age four normal children develop the ability to differentiate between their own beliefs and someone else's belief, and that there can be different beliefs about a single event. In the Sally-Anne experiment two dolls are used, Sally and Anne, of which Sally has a basket and Anne has a box. Sally has a marble and puts it into her basket - she then goes out Anne takes out Sally's marble and puts it into her box while Sally is away. Now Sally comes back and wants to play with her marble. The question is “where will Sally look for her marble?” The answer is, of course, “in the basket”. This answer is correct because Sally has put her marble into the basket and has not seen it moved. She believes that the marble is still where she put it<sup>2</sup>. 86% of the non-autistic children tested (Down syndrome) gave the correct answer, that is, they pointed to the basket. In contrast, 80% of the autistic children failed to appreciate Sally's false belief. The autistic subjects' failure on false belief tasks has been replicated in a number of studies using real people instead of toys, using a “think” question rather than a “look” question and using specific language-impaired children as a control group. (Leslie & Frith 1988, Perner et al. 1989). Although it has been shown that autistic children have a specific problem with mental representations, there are still a small group that are able to pass the tests. These autistic children tend to be older and more verbally able (Frith et al., 1991). Eisenmajer & Prior (1991) have argued that autistic children fail in theory of mind tasks due to pragmatic

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<sup>2</sup>For a detailed description of the Sally-Anne experiment see Frith (1989).

difficulties. Therefore older children, that acquire the verbal ability to understand the questions posed in the task, are able to pass it. The fact that success is dependent on age and verbal ability of the children tested is consistent with the hypothesis that Autism is characterized by a developmental delay. Theory of mind has been further tested by Happé (1991, 1993) using a set of stories about everyday situations where people say things which they do not literally mean. Happé's aim in this study was to show that able autistic subjects who passed second order theory of mind tasks were impaired at providing context-appropriate mental state explanations for the characters' nonliteral utterances in the stories, when compared to normal and learning disabled controls. The subjects were presented with a "why" question ("Why does X say this?") and a justification question ("Is it true what X says?"). In our view, these strange stories presented the subjects with a pragmatic problem of Implicature type (Grice, 1989) where they have to first identify the problem presented and then provide an appropriate solution to the identified problem. It is beyond the scope of this paper to further analyze the twelve strange stories presented in Happé's study in the context of a pragmatic theoretical framework. Happé has provided an explanation of her results in the context of Relevance Theory (Sperber & Wilson, 1986). Relevance Theory states that the selection of a particular context is determined by the search for relevance. Since some contexts are more easily accessed at any one time than others and are thus less costly in terms of processing effort, the speaker will use the first available context that produces sufficient contextual effects to meet the demands of relevance. According to Sperber & Wilson (1986), every act of ostensive communication communicates the presumption of its own optimal relevance. Arguing from the point of view of Relevance Theory, Happé suggested three distinct ways in which autistic individuals might fail:

1. Autistic individuals may fail to calculate relevance as normal speakers do because (i) they lack central coherence and cannot process information in context to derive normal contextual effects, and (ii) their different cognitive system and memory organization leads to a choice of context that is the most accessible in terms of cost but is idiosyncratic in interpretation.
2. Autistic individuals lacking a theory of mind are not able to use inferential communication that requires comprehension of intention.
3. Autistic individuals who lack second order representations will be unable to process ostensive inferential communication (Happé 1993, 1991).

In addition Happé speculates that Relevance Theory can also explain the observed autistic phenomena as obsessions and fixations. She explains these behaviors as a consequence of the failure to calculate relevance normally and as part of the autistic individual's odd focus of attention. Happé showed that even very able autistic adults present some characteristic handicap in communication and suggested that Relevance Theory can present an adequate framework for understanding this deficit.

Under the above theory, the world of the autistic person must be a terrifying, unpredictable and punishing world. Maybe this possibility is what led Tustin (1991) to define Autism as “an early developmental deviation in the service of dealing with unmitigated terror” (p. 575). Psycho-analysts used to view Autism as a regression to a normal so called autistic phase in childhood. Tustin revised this view and stated that it is more correct to use the term Autism for “certain specific pathological conditions in which there is an absence of human relationships and gross impoverishment of mental and emotional life, this impairment being the result of the blocking of an early aberrant development of autistic procedures” (p. 585).

Normal children between the ages 3-6 years old develop the capacity to attribute mental states. They develop the capacity that one has, and that others have, beliefs and desires, the capacity to perceive that others may have false beliefs or to be ignorant of what one knows, the capacity to perfect the telling of lies. According to the theory of mind, autistic children suffer from a specific cognitive disorder that results in the failure to develop the above capacities.

The following areas are influenced by the above specific impairment:

**Pretence** - autistic individuals, unlike normal two-year olds, fail to show pretend play (Fein, 1981). In order to engage in pretend play (to use a banana and make believe it is a telephone) the subject has to be able to represent mental states.

**Socialization** - autistic individuals are capable of social skills that do not involve a theory of mind. For example, they can manipulate behavior to achieve a desired end, although they cannot use deception. (A nonverbal child will take a caretaker's hand and lead him/her to the desired object or action). Such behaviors seem to indicate an understanding of goal-directedness and some understanding of desires as drives to be present. (Baron-Cohen 1991, Tan & Harris 1990).

**Communication** - The communication of autistic individuals has been described as instrumental. One of the issues discussed has been whether the gestures and speech used by autistic individuals are “protodeclarative” or “protoimperative”. Protodeclarative gestures indicate an external referent to communicate something about the signaler's internal state (“Look at that bird; I'm interested in it”). Protoimperatives, on the other hand, indicate an external referent to achieve a behavioral end (“Look at that bird; give it to me”). Baron-Cohen showed that autistic children use and understand protoimperatives but protodeclarative pointing is not used (Baron-Cohen, 1989). Similarly, autistic children use instrumental gestures but not expressive ones (Attwood, 1988). These researchers argue that protodeclaratives are more advanced because they require a theory of mind. The meaning of words varies with context, we understand language in terms of a speaker's intentions rather than as a code. Autistic individuals seem to be using language in fixed codes and set meanings. This can be observed in the use of echolalic phrases that are used irrespective of context.



**Social skills** - There are autistic individuals who have an average IQ despite their deficiencies in imagination, socialization and communication (Gillberg, 1991). In contrast, some high functioning autistic individuals may be able to use their non-social intelligence to unravel the problems of social situations. This is in opposition to the specific domainness of social abilities in normal children. Nubez & Riviere (1990) have shown that social skills are relatively independent of other abilities. Close connections between social and non-social intelligence may be a feature of abnormal rather than normal development.

### **3. The Pragmatics of Language point of view**

Research in the area of Autism has concentrated on the interactive, affective and social aspects of the deficit. We believe that the core deficit in Autism lies in the area of pragmatics of language and propose to approach the problem from this point of view. Aspects of phonology, syntax and semantics have been studied previously with confusing results. Lately, the aspect of pragmatics has become prominent in research and it is generally accepted that difficulties in the domain of pragmatics are present in Autism (Rapin, 1991). However, most researchers still conclude from their studies and clinical observation that it is more appropriate to speak of severe communication impairment rather than of language impairment (Frith, 1989). We would like to argue that the impairment lies in the area of pragmatics of language and not in communication as such. The theoretical framework we would like to apply here is based on the view of pragmatics as a study of language use that distinguishes between language and communication. Pragmatics is viewed as the linguistic conditions of appropriate use of sentences in context: the knowledge of basic speech acts types, such as assertions, questions and commands; the knowledge of all the systems of rules governing “things done with words”, such as congratulations and proclamations; the knowledge of what is to be included in talk-in interaction pragmatics, which is pragmatic knowledge governing basic aspects of conversation, such as organization of turn-taking, organization of sequences and organization of repair (Kasher, 1991). Kasher proposes a distinction between different types of phenomena that have been mingled with each other under the heading of “pragmatics”. In his view, a distinction should be made between the knowledge we have of basic speech act types, such as assertions and questions, and the knowledge we have of principles of intentional action. Kasher hypothesizes that the pragmatic knowledge of the appropriateness of the relationship between sentences and contexts of use consists of separate parts, of which the first is purely linguistic, while the second is not:

1. Modular pragmatic knowledge
2. Central pragmatic knowledge

In addition, Kasher proposes a new notion of module, which replaces the notion of module in Fodor's sense as an input cognitive system with certain properties, by a notion of a module as a cognitive system that is "independent" in several significant respects (Kasher, 1991). It is domain specific, it is informationally encapsulated, it is associated with a fixed neural architecture, it has specific breakdown patterns and its ontogeny has a characteristic pace and sequencing. Taking the modularity of pragmatic knowledge hypothesis, according to which there could be various pragmatic modules (under 1.), we will describe the different types of pragmatic knowledge and explain how they are manifested in the autistic individual.

**Core Pragmatics.** The knowledge of basic speech act types such as assertion, question, requests and commands. This type of knowledge is considered universally required in order to master one's own language. Carr et al. (1975) demonstrated that autistic children were most likely to echo questions and commands to which they had not learned an appropriate response, but rarely echoed questions and commands to which they had learned an appropriate response. The aim of this study was to reduce echolalia and the children indeed learned to respond. However, their learning was specific and did not generalize to all situations. In a further study, Shreibman & Carr (1978) taught the children to respond to a set of previously echoed questions with the sentence "I don't know". It was judged not feasible to teach a child a response to every verbal stimulus that might be encountered. It seems that autistic children have difficulties in achieving proficiency in this type of pragmatic knowledge - the ability to understand and use basic speech acts. The high functioning autistic children acquire some rudimentary pragmatic knowledge and they learn to answer questions in yes/no or one word responses. Whenever we perform a speech act we reconstruct a new form - it is never the same act - it is a new creation that is being acted upon the specific context. The autistic child seems to be acting in a camera-like fashion, in fixed and fragmentary states which do not lead him to be creative and construct appropriate speech acts that will fit the context. Studies of intelligence in autistic children have shown that they perform well on IQ-tests where a wider context is missing and show a low performance where context is important. The opposite is found in normal children. Hermelin & O'Connor (1964, 1970) tested differences in memory tests in children matched for their capacity to recall digits. It was found that the feature that did not enhance recall for autistic children as much as for normal or retarded children is meaning. Autistic children remembered unconnected words almost as well as meaningful sentences, and unconnected bits of information as well as those that are part of a meaningful context. Stephen, an autistic man with a special capacity for drawing, has been described by O. Sacks in his book "An Anthropologist in Mars". Sacks reports that when Stephen was six years old he had learned to ask for "paper" when he needed it. Sacks adds that for many years, Stephen had not understood how to ask for anything, even by gesture or pointing. The ability to understand and use the basic speech act of request usually develops around the second year of life in normal children. At the age of 13, Stephen was described as extremely gifted in the area of visual recognition and drawing from memory but with a verbal IQ of only 52 (Sacks, 1994).

However, this does not mean that autistic children do not have desires. They do show proficient use of communication to achieve environmental needs. (For example, a child that wants food or a toy will lead the adult's hand to the specific place where the object can be taken). Intentionality is not absent in autistic children, but rather it is initially motivated solely by environmental needs.

**Amplified Core Pragmatics.** The knowledge of all the systems of rule governing “things done with words” which are not basic speech acts types, such as congratulation and proclamation. As stated above, autistic children are extremely echolalic, they repeat just heard sentences or heard in previous occasions. For example, a mother says to her daughter: “Say hello, Ruth”, and Ruth echoes: “Say hello, Ruth”. Ruth did not interpret the utterance, she did not do anything with the words and of course disregarded the entire context. Ruth knows the words, knows how to make a grammatical sentence, but she does not possess the pragmatic knowledge of rules that govern the things to do with words.

**Talk-in Interaction Pragmatics.** The pragmatic knowledge governing basic aspects of conversation, such as organization of turn-taking, organization of sequences and organization of repair. These kind of pragmatic knowledge has been found to be deficient in autistic individuals. Turn-taking and the differentiation of new from old information have been shown to be inadequate. Topic introduction, maintenance and change is highly inappropriate, sometimes highly verbal autistic speakers use discourse markers (“by the way...”, “well, anyway...”) when they are not introducing a new topic (Baltaxe 1977, Curcio & Paccia 1987). Deficiencies in this area of pragmatics have a great influence in the social life of autistic individuals. It also makes it very difficult for them to develop and maintain intimate relationships.

Williams describes her difficulty in this area of pragmatics as a lack of the concept of “talking with”: when somebody else spoke she would either say nothing or speak over them on her own track like “an express train stopping at no stations until the end” (Williams 1994, p. 72). Later, with the help of her therapist she begins to understand how people who try to converse with her get confused and assume she is not listening or is selfish when she continues talking on her own topics, and figure she did not care when she could not get emotional expressions and words going at the same time. Williams developed at the age of ten a strategy of saying sentences to herself in order to get meaning from a whole sentence. She developed the skill to the point that she could speak to the other person with an almost imperceptible delay, and then she would try to imagine what she would have meant if she would have said those words from her own thoughts. According to Williams, this strategy helped her gain some meaning of what she heard and read. However, she still felt she had no concept of enjoying a conversation for company's sake.

**Central Pragmatics.** Knowledge related to general cognitive systems and to language use. It includes conversational implicatures and “indirect” speech acts, politeness, registry and style (Kasher, 1991). According to Kasher's Rationality Principle, “a rational speaker opts for a speech act which not only attains one's purpose most effectively but also does it

at least cost, and it is up to the speaker to determine what counts as cost and what may be disregarded” (Kasher 1982, p. 35). Our working assumption is that the autistic speaker adheres to the rationality principle, but his interpretation of the speech act and its context will determine what counts as cost for him and what may be disregarded. It has been observed that autistic individuals seem to miss what we would regard as salient in a situation, and pay close attention to what seems to us irrelevant. Rincover & Koegel (1975) found in their studies that autistic children tended to learn responses to irrelevant details of the teaching situation such as the teacher's dress, which severely limited the generalization of learned responses. Frith (1989) argues that autistic children do not process stimuli for meaning and considers this behavior a deficiency in central coherence. In the study by Baltaxe (1977), German-speaking autistic adolescents confused the polite and familiar form of address (Sie and Du), a confusion that will greatly affect acting upon social roles in conversations. A four-year old autistic girl addresses one of the authors by full surname and family name. In most studies the most striking finding is that autistic individuals understand and use language extremely literally, use too short or too long and sometimes pedantic utterances. According to Grice (1989), talk exchanges are characterized to some degree by cooperative efforts. He formulated a general principle which participants will be expected to observe. Under the assumption of this general “Cooperative Principle”, Grice distinguished four categories: Quantity, Quality, Relation and Manner. From previous descriptive studies and from clinical observation we can conclude that autistic individuals fail to observe these principles (Dewey 1991, Cesaroni & Garber 1991, Williams 1994). Since high-functioning autistic individuals do learn from other people's behavior by reflecting, they act sometimes as if they are conversing. They can learn how to deal in one context but they can be lost when confronted by the same situation in another context. It seems that information is being stored and categorized in a rigid way without grasping the subtleties of the maxims of Quantity, Quality, Relation and Manner nor the ability to apply it in different contexts. Williams asks her therapist to teach her rules that she could carry around with her and that she could apply to all situations regardless of context (Williams, 1994). This observation shows how difficult it is for Williams to interpret context and how costly it is for her to act appropriately in each situation when the knowledge related to general cognitive systems and to language is not easily accessible to her. Jim, an autistic young man, says that he is “communication impaired”, because he is only good at using words “when they mean what they mean” (Cesaroni & Garber 1991, p. 310). Moreover, Jim explains that he gets confused when people bring in things that aren't related to what they said they wanted to talk about, and don't explain how the different subjects fit together. For Jim it is very difficult to understand and use implicatures, indirect speech acts, registry and style and the assumption of the Cooperative Principle is not available for him. It seems that the considerable effort he needs to put in interpreting what goes on is not effective and this may explain why autistic individuals have been described as having a pervasive lack of responsiveness to others or an innate inability to develop emotional relationships with other people (Hobson, 1989).

**Interface Pragmatics.** The knowledge which involves integration of data from a linguistic channel with data from other channels, such as indexical expressions. This kind

of knowledge appears to be extremely deficient in autistic individuals. This area of pragmatics includes all paralinguistic and nonverbal aspects of language and they reflect a manifestation of the knowledge which involves integration of data from a linguistic channel with the data from the perceptual and motor channels respectively. Data from different studies show that the peripheral sensory and motor processes are not damaged (Hermelin & O'Connor, 1970). The dysfunction lies in the integration of these processes with the linguistic processes. The ability to discriminate fine visual and auditory information has often been shown in Autistic individuals. For instance, they have been shown to have absolute pitch discrimination and have an excellent ability to discriminate visual details. Autistic children have been described as avoiders of "eye contact" thus perpetuating the myth of Autism as an anti-social and anti-interpersonal contact phenomena. It is not that there is gaze avoidance, rather than that what is deficient is the integration between the motor channel involved in gazing and the linguistic channel that tells the person when, how, where and what use to give to the gazing activity in relation to the use of language. It is interesting to note that in Asperger's first description of Asperger's syndrome in 1944 these pragmatic aspects were addressed. Asperger stated that Autistic children do not look with a firmly fixed glance at anything, but rather seem to perceive mainly with their peripheral field of vision. He also added that the children have a paucity of facial and gestural expression and that they do not use the gestures and expressions as a contact-creating device (Frith, 1991). Furthermore, Asperger also addressed the paralinguistic aspects of the language of autistic individuals. He described their language as "unnatural, often like a caricature which provokes ridicule in the naive listener... autistic language is not directed to the addressee but it is often spoken as if into empty space" (p. 70).

Difficulties in this area of pragmatics are beautifully depicted by Williams when she asks her therapist to "take the dancing out of your voice (intonation) and not pull faces (facial expression) so you don't distract me from what you're saying" (p. 95). In this way, Williams felt she could listen with meaning to the words of her therapist. Another high-functioning autistic person describes his difficulties interpreting sensory information coming from two different channels. Jim says that "sometimes the channels get confused, as when sounds come through as color, sometimes I know that something is coming in somewhere, but I can't tell right away what sense it's coming through". (Cesaroni & Garber 1991, p. 305). Jim is describing his difficulties integrating information coming from a perceptive channel and from a linguistic channel.

We have shown that the impairment in Autism goes far beyond an impairment in communication and affects all areas of pragmatic knowledge, to an extent depending on the degree of Autism. It ranges from a complete lack of pragmatic knowledge in the low-functioning retarded nonverbal autistic individual to the acquisition of partial (but inadequate) pragmatic knowledge in the high-functioning autistic and Asperger's syndrome individuals. (It has not been determined yet, whether Asperger syndrome is a biologically specific entity or it is the upper range of the autistic distribution).

The theoretical framework of pragmatics of language as described above can account for the core deficits of Autism as presented in DSM-IV (Volkmar et al., 1994). The first and third characteristics in the social interaction area pertain to Interface Pragmatics, “marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, gestures to regulate social interaction” and “a lack of spontaneous seeking to share enjoyment, interest or achievements with other people (e.g., by lack of showing, bringing, or pointing out objects of interest)”. The second and fourth items represent the consequences of an inability to integrate data from the linguistic channel with data from the perceptual, emotional and motor channels. This inability will manifest in the “failure to develop peer relationships appropriate to developmental level and lack of social or emotional reciprocity”.

The four items in the Qualitative Impairments in Communication area pertain to deficits in pragmatics of language. The first one, “delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative models of communication such as gesture or mime)” is too broad and it can indicate a general deficit in all areas of pragmatics, including the purely linguistic and the non-linguistic core pragmatics. This broad definition may be necessary in cases of differential diagnosis with aphasia where the area of pure linguistic pragmatics is greatly affected but there is some pragmatic knowledge possibly in the area of Talk-in interaction and Interface Pragmatics.

The next item, “in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others”, although also a broad definition, pertains to the area of Talk-in Interaction Pragmatics. It reflects an inadequate understanding and use of the pragmatic knowledge governing basic aspects of conversation such as organization of turn-taking, sequences and repair. The next two items represent a consequence of general lack of pragmatic knowledge, in the case of “stereotyped and repetitive use of language or idiosyncratic language” it could stem sometimes from a basic knowledge in basic aspects of conversation but not knowing what to do (e.g., understanding and using basic speech acts).

The last item, “lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental levels”, pertains to inabilities in Central Pragmatics, in the knowledge related to general cognitive systems and to language use. Deficiencies in the understanding and use of indirect speech acts, implicatures, politeness, registry and style will strongly affect the play and the social life of autistic individuals.

Dewey presented a group of young autistic individuals and a group of normal young people with an informal test of knowledge of human relations. She created a number of stories involving some ordinary social interaction mingled with unusual interactions. The seven young high-functioning autistic young men that took the test rated the behaviors in the stories in idiosyncratic ways. According to Dewey, they failed to understand the stories in a conventional way and their judgments appeared to be influenced by their own experiences or on behavioral rules they had learned and applied rigidly (Dewey, 1991).

These autistic individuals do not possess the core pragmatic knowledge to interpret those social situations and to be able to judge them appropriately. Finally, the last area of the DSM-IV, “restricted repetitive and stereotyped patterns of behavior, interests and activities”, also may be related in an indirect way to pragmatics. This area detects abnormalities in the ability to understand and use topic organization not only at the instance of a specific conversation, but in a broader social interactive way, that we postulate as stemming from an inability to apply the Rationality Principle. The language impairment associated with Autism may be viewed as a deficit in both competence and performance ranging across purely linguistic and nonlinguistic pragmatics.

The fact that Autism is a disorder of early onset raises the question of how early it can be diagnosed. Knobloch & Pasamanick (1975) found that the potential symptom of Autism, namely, the failure to regard people as persons was useless as an early indicator of Autism. What comes out as an abnormality may be an indication of mental retardation. The relative late manifestation of the critical features of Autism as well as the dubious significance of poor social contact in early infancy, suggest that autistic children suffer from a deficiency in a particular mental capacity that in normal development does not mature until the end of infancy. Since pragmatics of language is a mental capacity that develops at the end of infancy, it may well be that pragmatic competence would be a better indicator to diagnose Autism.

## **4 Conclusions**

We have proposed a theoretical framework of modular pragmatics of language to explain the core deficits in Autism and to characterize the syndrome not only as a communication disorder but as a disorder of pragmatics of language. This hypothesized framework needs to be tested experimentally. A battery of neuropragmatic tests (Kasher et al., 1991) is currently being used to assess the pragmatic abilities of brain hemispheric damaged subjects and schizophrenic subjects. We intend to apply this battery of tests to a group of autistic subjects.

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