

Autistic Sociality

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Abstract This article is based on our decade-long linguistic anthropological research on children with autism to introduce the notion of “autistic sociality” and to discuss its implications for an anthropological understanding of sociality. We define human sociality as consisting of a range of possibilities for social coordination with others that is influenced by the dynamics of both individuals and social groups. We argue that autistic sociality is one of these possible coordinations. Building our argument on ethnographic research that documents how sociality of children with autism varies across different situational conditions, we outline a “domain model” of sociality in which domains of orderly social coordination flourish when certain situational conditions are observed. Reaching toward an account that comprehends both social limitations and competencies that come together to compose autistic sociality, our analysis depicts autistic sociality not as an oxymoron but, rather, as a reality that reveals foundational properties of sociality along with the sociocultural ecologies that demonstrably promote or impede its development. In conclusion, we synthesize the “domain model” of sociality to present an “algorithm for autistic sociality” that enhances the social engagement of children with this disorder. [autism, sociality, conversation, theory of mind, baby talk]

This study draws on our decade-long linguistic anthropological research on children with autism to introduce the notion of “autistic sociality” and its implications for an anthropological understanding of sociality. Autistic sociality is not an oxymoron but, rather, a systematically observable and widespread phenomenon in everyday life. Without disregarding or underestimating the social impairments related to this condition, we reach toward an account that comprehends both limitations and competencies of autistic sociality. Our ethnographic study of the daily lives of children with autism indicates that their sociality varies across different situational conditions. This article outlines a “domain model” of sociality in which domains of orderly social coordination flourish when certain situational conditions hold and presents an “algorithm for autistic sociality” that enhances the social engagement of children with this disorder.

For decades, the field of anthropology, along with other social sciences has been concerned with the question of sociality (cf. Bateson 1972; Bourdieu 1977; Boyd and Richerson 2005; Enfield and Levinson 2006; Fiske 1992; Garfinkel 1967; Geertz 1973; Giddens 1984; Goffman 1959; Hymes 1972; Lévi-Strauss 1963; Sacks 1984; Sapir 1927). This, of course, is not one question, but many. What constitutes sociality? What are the foundational properties of sociality? How is sociality enacted across different social situations and social groups? How do children develop competence in sociality? In the framework we present here,

human sociality consists of a range of possibilities for social coordination with others, and autistic sociality is one of these possible coordinations. This perspective does not impose a dichotomous distinction between autistic and normative sociality but, rather, highlights the gray areas of sociality shared by those diagnosed with autism and neurologically unaffected persons.

Autistic sociality brings astonishing clarity to the understanding of foundational properties of human sociality and the sociocultural ecologies that demonstrably promote or impede its development across the life span. Autism holds an arguably unique place in the anthropological investigation of human sociality, in that autistic impairments make visible fundamental components of human social cognition and the social brain. To understand autism is to understand what it means to have relationships with people and material objects and the role of cultural and situational context in achieving joint attention, attunement, intersubjectivity, and social coordination of feelings and actions.

Autism evidences the centrality of structured domains of social life, including rules, codes, kinship, calendars, schedules, routines, and the relatively stable spatial layouts of communities, schools, neighborhood supermarkets, and one's home. These pockets of orderliness constitute zones of social comfort for persons with autism, in that they possess heightened proclivities to systemize information. These same systemizing skills are also highly adaptive for certain kinds of work, including engineering, information technology, mathematics, and exact sciences. Alternatively, autistic impairments poignantly make clear just how difficult social life can be without the necessary competence to respond appropriately and effectively to contingent, shifting events, such as disrupted plans, unexpected requests or other social moves, late buses and appointments, furniture differently arranged, and topical domains of knowledge that drift without announcement in the flow of ordinary conversation. Persons with autism often become overwhelmed when faced with such unpredictable shifts in circumstances, revealing the range of adaptive skills essential to being a social agent (Bourdieu 1977, 1990a, 1990b).

Ethnography of Autism Project

The Ethnography of Autism Project comprises several research endeavors undertaken since 1997 that examine how children diagnosed with autism spectrum disorders (ASD) participate in quotidian life at home, school, and other community settings. This research has focused on illuminating social (esp. communicative) abilities and impairments of children at the extremes of the autism spectrum, including high functioning children with autism, or Asperger's Syndrome, and severely impacted children with autism (see Solomon 2008).

An initial study of the interactional moves and meaning construction in social encounters included sixteen 8–12-year-old high functioning children with autism and Asperger's Syndrome who were fully included in regular public school classrooms. The study analyzed a corpus of approximately 380 hours of video and audio recordings of everyday interactions

with family members at home, in transit to and from school, and with peers and teachers at school. Researchers also photographed quotidian environments in which the children routinely conducted their social life and interviewed parents about family history and the children's daily schedules and social networks. In addition to the ethnographic component, to confirm diagnosis researchers administered Autism Diagnostic Interview-Revised (Le Couteur et al. 1989) and the Autism Behavior Checklist (Krug et al. 1978). The children's abilities were assessed using the Wechsler Intelligence Scale for Children (Wechsler 1992), and a series of theory of mind tasks (Baron-Cohen 1989; Baron-Cohen et al. 1985; Happé 1994b; Leslie and Frith 1988).

A second study involved 16 severely impacted children with autism ages three to 18. Six of these children were engaged in a communicative practice called the Rapid Prompting Method (RPM). This practice, which allowed the children to point to symbols rather than speak, was introduced by South Indian educator Soma Mukhopadhyay.¹ The other children in the study were communicating through a method that was related to RPM but that evolved into a different practice as it was passed from one family to another.² A corpus of approximately 200 hours in total of video recordings of severely affected children with teachers and family members captures the transformations in communication over a period of five years.

A third study examined how five children with autism ages 4 to 14 participated in animal-mediated social interaction. Two of the children were high functioning and three were severely impacted. The children were video recorded interacting with an animal trainer, service and therapy dogs, family members and therapists at home, in parks and other recreational locations. Approximately 65 hours of video and audio data were collected that also included audio-recorded interviews with parents about the children's development (see Solomon this issue).

Sociality as Social Coordination

Our academic involvement with autism has led us to conceptualize human sociality as consisting of a range of possibilities for social coordination with others. The range of possibilities for social coordination is influenced by the dynamics of both individuals and social groups (see Figure 1).

The range of possibilities for social coordination is configured by an individual's life experiences, developmental maturity, talents, and neuropsychological and physical conditions.



Figure 1. Influences on range of possibilities for social coordination.

These individual dynamics may inhibit or amplify the range of possibilities for social coordination. Early experiences of great personal loss, for example, may impact possibilities for sustained coordination in intimate relationships later in life. A neurodevelopmental condition such as autism will dramatically affect how a person with this condition socially coordinates with others. Persons with autism possess a characteristic range of possibilities for social coordination that we endeavor to describe through our research.

The possibilities for social coordination are also sociohistorically delimited, fluid, and variable across members of communities (Bourdieu 1977; Durkheim 1938; Geertz 1973; Giddens 1979). The dynamics of social coordination within and across social groups are captured in Bourdieu's notion of habitus as a circumscribed yet transformable set of dispositions and situated logics that members of social groups employ to interpret and enact social practices (1977, 1990a, 1990b). Members of communities have differential access to particular kinds of social coordination, in that participation in social practices is inextricably and unequally tied to one's positioning within social domains such as social classes, institutions, and academic disciplines. More broadly, social coordination with others is enacted within and through differentially attainable social relationships, institutions, activities, spheres of knowledge, ideologies, emotional paradigms, and moral frameworks. Habitus and social position configure the range of possibilities for social coordination among members, and, reciprocally, certain forms of social coordination offer members opportunities to sustain or alter the habitus of social groups and social positions within these groups.

A classic concept in linguistic anthropology is that each speech community is distinguished by a communicative repertoire of, for example, languages, dialects, registers, jargons, and styles (Ferguson 1959; Gumperz 1968). The entire repertoire of a speech community is usually not shared by all members, although some parts of their repertoires overlap. We extend here the notion of repertoire to refer to *repertoires of social coordination* and to the idea that members of communities are equipped with partly overlapping and partly distinct repertoires of social coordination, which are organized by individual and sociocultural lifeworlds.

Thus, for example, the repertoires of social coordination of an autistic child's parents, teachers, and therapists may partly overlap with yet partly be distinct from each other. Moreover, these repertoires may more or less overlap with those of children with ASD. A central goal of our research is to discern where these repertoires do overlap facilitating autistic sociality and where they diverge and prove to be poorly designed for socially coordinating with children with this disorder.

In thinking about points of overlap in social coordination, it is useful to borrow from the field of physics the notion of the "domain state" as shown in Figure 2 (Cowburn and Welland 1998; Fleury 1981; Ford 1982; Hurd 1982). The domain state consists of pockets of order within an otherwise disordered matrix of atomic spins. When a magnetic material undergoes a phase transition (e.g., when a change in heat or magnetic force is applied), its

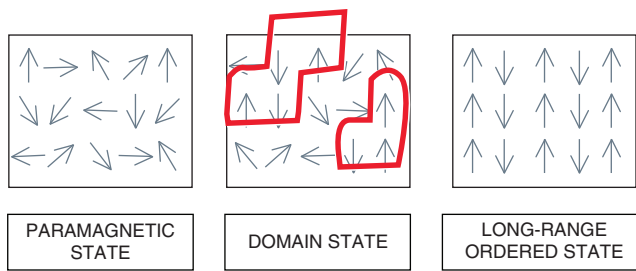


Figure 2. Phase transition to and from the domain state.

atomic structure may shift from a disordered (paramagnetic) state to a partly ordered (domain) state to a long-range ordered state.

The domain state captures our perspective on points of overlap between the repertoires of social coordination of autistic children and their interlocutors. There are domains of orderly social coordination that transpire in a field of social discoordination. We identify pockets of social coordination with autistic children that appear ordinary (ordered domains of social coordination) against a backdrop of subtle and catastrophic ruptures in social coordination between autistic and neurotypical interlocutors (disordered social coordination).

To summarize as shown in Figure 3, to understand autistic sociality it is helpful to conceptualize sociality as a (1) range of possibilities for social coordination, which is maximized when (2) the dynamics of individuals and social groups make possible the overlap of repertoires, which in turn affords (3) domains of orderly social coordination.

This perspective has implications for the social development of children with autism spectrum disorders. The range of possibilities for social coordination between even severely impacted persons with autism and others is not so narrow as to warrant the conclusion that members with autism are incapable of sociality. Instead, persons with autism possess a

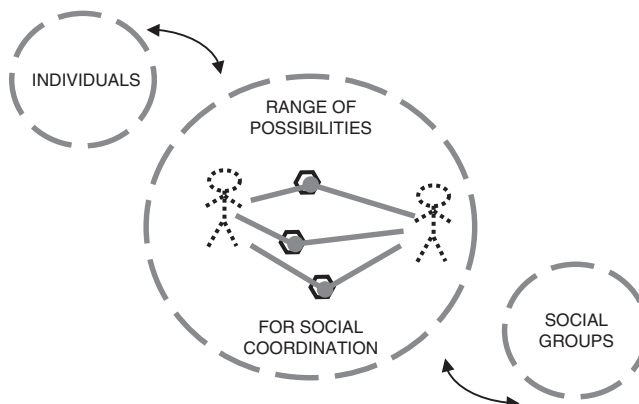


Figure 3. Dynamic processes of sociality.

characteristic range of possibilities for social coordination that is shaped not only by their disorder but also by the sociocultural practices of the communities they inhabit and the interlocutors with whom they interact. A central concern of researchers and clinicians has been to identify the parameters that characterize the restricted range of possibilities for autistic sociality. The present study indicates sociocultural conditions that promote or impede domains of orderly social coordination with children diagnosed with ASD. Below we illustrate how individual and sociocultural dynamics organize autistic sociality.

Language Repertoires of Family and Clinic

It is family dinnertime in the home of John Chang, a 12-year-old high functioning boy with autism.³ At the dinner table are John, his parents, and his older brother Jack. John's individual neurodevelopmental condition partly accounts for why he is less engaged in the family conversation and more absorbed in watching a news program on the television set in the same room. But sociocultural elements also organize this dinnertime scene: John's parents are first generation low-income Chinese Americans who speak Chinese as their first language and English with great difficulty as their second language. When John was diagnosed with autism, clinicians advised the parents to stop speaking Chinese to John and to use only English, so that he could communicate with educational and clinical staff. As a result, John's parents began to use fluent Chinese with each other and with their older son Jack and to switch to a telegraphic variety of English with John, sometimes assisted by Jack, who has command of both languages. This clinically and ethnically provoked communicative habitus accounts in part for why John's parents and older brother form a semiseparate social unit at the dinner table, with the occasional inclusion of John.

In the dinnertime under consideration, John hears a news report of an avalanche at a ski resort caused by explosives used by authorities. He turns to his family members, who have been conversing in Chinese, to report this information in English. But they do not quite understand the information John provides, and they try to explain to him in limited English that the avalanche was caused by the weight of the heavy snow:

- | | |
|---------|--|
| John: | Avalanche!
...
They caused it by the bomb. |
| Mother: | Uh uh.
Bomb? |
| John: | By the what? |
| Mother: | Too much snow there. |
| Father: | Too much snow, heavy.
Snow, high, heavy. ⁴ |

When John asks for further information, his father is at a loss in English and asks Jack in Chinese for the term he wants to use *gravity*:

- John: How do they, um, how do they uh make it go down?
- Father: You know ((pause)) heavy.
Jack, zhongxin zhao shenme? (*Jack, what is gravity in [English] called?*)
- Jack: Gravity.
- Father: Gravity. Okay? ((moving hands in a downward direction))
They pull down.
Something look like this.

Only after Jack informs his parents in Chinese that John is in fact correct do his parents support John's position:

- Jack: Ta shuo de dui (*He said it right*)
- Father: Ta you shenme du? (*What did he say that was right?*)
- Jack: . . . Tamen bu ziji zha, renguo gu de shihous, shuai le, tamen dou si le. (*If they don't blow it up themselves, when people go across, they will all die.*)
Tamen xian zha yix (*So they blow it up beforehand.*)
- Mother: Oh, so they did bomb it, huh?
- Father: So, you got it, huh?
- Mother: He saw it.

We will never know for certain if the family's communicative difficulties stem from the English-only prescription for communicating with John as well as John's autistic impairments. Yet both factors appear to play a role: Autism-related impairments likely account for John's failure to provide adequate information about the avalanche for his parents. He states "They caused it by the bomb" without clarifying the referents for "they" or "the bomb." But in addition John's parents' lack of proficiency in English impedes direct, fluent dialogue with John about the avalanche, requiring John's brother to "ventriloquate" both his parents' and his brother's positions on the topic (Bakhtin 1981).

One could argue that the advice given by the autism clinic to John's parents is not so much a matter of sociocultural dynamics as science, not so much ideology as fact. Science studies, however, argue that culture applies to science as much as to other institutions and that scientific practices are socially organized and culture-historically rooted (Biagioli 1999; Galison 1987; Traweek 1992). Habitus and practices may distinguish a scientific paradigm or a clinical program.

The clinicians' advice to promote English was likely motivated by John's delayed language development, which is a diagnostic feature of autism, as well as the fact that their clinical protocols are English based. Yet, why did the clinical staff not suggest that English be used along with Chinese in the home? The English only advice rests on an assumption that bilingualism is formidable for children with language delay. The assumption that bilingualism is linked to language delay has been contested by studies that indicate no strong correlation (Dyches et al. 2004; Pearson et al. 1993; Pettito et al. 2001).⁵ In our study of high

functioning children with autism, we video recorded another Chinese American child using productively both Chinese and English with his parents, who had decided to ignore the clinical advice to use only English in speaking to their son. The two Chinese American children manifest roughly the same severity of conditions of autism spectrum disorder. The second child's demonstrated capacity for bilingualism suggests that such linguistic abilities are within the potential of children with this condition. Moreover, given that the family is the primary institution for nurturing social and emotional bonds, the importance of the mother tongue and default language of the home for promoting autistic sociality cannot be overstated (see Kremer-Sadlik 2005).

Conversation Sequences

A central question posed by Schegloff in his contribution to the *Roots of Human Sociality* (2006:73) is “whether human sociality is a matter of knowing together or doing together.” In response to this question, we found differential competence in these two kinds of sociality among the 8–12 year old high functioning children with autism in our study. As we discuss below, the children displayed more competent social coordination with others when participating in sequences of conversational actions (i.e., “doing together”) than they did in maintaining a sequence of propositions that cohere around the same topic in the form of, for example, extended narratives, plans, arguments, and prayers (i.e., “knowing together”).

Domains of orderly social coordination with high functioning children with autism or Asperger's Syndrome were frequent when they engaged in conversational sequences such as question—answer, greeting—greeting, request—response, and assessment sequences (Kremer-Sadlik 2004; Ochs and Solomon 2004). Such interactional competence was displayed with peers as well as with adults. Even when the children lacked stylistic subtleties expected in peer exchanges, they still understood and responded to the interactional moves directed to them, as illustrated in the following playground greeting involving John Chang and his classmate:

- | | |
|------------|---|
| Classmate: | Uh hey hey what's up dog? |
| John: | Oh nothing ((gestures for emphasis)) |
| Classmate: | Hey! No no say <u>that</u> .
Just go- say “What's up dog?” |
| John: | No nothin'. |
| Classmate: | If Kristen tells you, will you say it? |
| John: | Kristen has been (mad) (xxx). |
| Classmate: | <u>John</u> John John? Say “What's up do:g?” |
| John: | ((coughs)) |
| Classmate: | John John |
| John: | <u>What's up do:g?</u> |

In this exchange John recognizes “What’s up do:g?” as a greeting and provides a greeting response. But John’s response “Oh nothing” is deemed uncool, and he is instead prompted by his classmate to return with “What’s up do:g?” to which John complies (even drawing out the vowel sound in *dog*).

Most of the high functioning children with autism or Asperger’s Syndrome could manage complex conversational sequences that included insertions and presequences, displaying an ability to manage local interactional contingencies. The facility with which these children initiate and respond to conversational moves is illustrated in the following dialogue that transpires one afternoon after school between Don, a nine-year-old high functioning boy with autism, and his mother.

- Mother: What’s the matter?
- Don: Just thinking.
- Mother: What are you thinking about?
- Don: Halloween.
- Mother: What- what about Halloween?
- Don: I- I can’t wait to be- to hold this bow and arrows and be Native American.
- Mother: You know what?
- Don: Ha?
- Mother: We’re not gonna be able to take the arrows to school.
- Don: Great.

Don and his mother successfully coordinate across a series of linked conversational sequences. Don provides appropriate responses to his mother’s three information questions then participates seamlessly in each step of an announcement sequence. When his mother initiates a preannouncement move (“You know what?”), Don produces a relevant next move “Ha?” that indicates both that he does not know what she is going to say and that he is expecting her to supply the announcement in the next turn. After she reports that he will not be able to take arrows to school as part of his Halloween costume, Don makes the sarcastic assessment “Great,” sounding very much like any boy his age in this circumstance.

The fluency for local social coordination of conversational actions that we observed for high functioning children with autism or Asperger’s Syndrome indicates that local sequences of actions are highly accessible and acquirable and a candidate for constituting a basic building block of human sociality.⁶ The autistic children’s heightened competence in the local social coordination of actions has led us to reconsider the link between theory of mind and human sociality. Specifically, we propose to split theory of mind competencies into “sociocultural” and “interpersonal” perspective taking (Ochs et al. 2004). The observation that high functioning children with autism or Asperger’s Syndrome routinely respond appropriately to the immediate conversational actions of interlocutors suggests that they can competently

engage in locally circumscribed sociocultural perspective taking, reading intended conversational moves within the confines of local sequential contexts.

Sociocultural perspective taking is a product of successful language socialization into communities of social practice. In engaging in local conversational sequences, high functioning children with autism or Asperger's Syndrome display knowledge of preferences and expectations regarding conversational turn taking as members of and social actors in particular communities. Alternatively, interpersonal theory of mind draws on past and current awareness of another individual person's experiences, feelings, beliefs, and intentions in particular situations. We concur with psychological studies that attest to theory of mind impairments for autistic children (e.g., Baron-Cohen et al. 1985), but argue that sociocultural and interpersonal perspective-taking abilities need to be distinguished. Conforming to Grice's (1975) conversational maxim to make one's conversational contributions relevant to the informational flow of propositions, proved difficult for the high functioning children with autism or Asperger's Syndrome in our study, especially when topics were not centered on the children themselves. As anyone who has studied topicality and coherence knows, relevance is a fuzzy notion to pinpoint, and it has the same standing for intelligent autistic children. The children conformed to the relevance maxim in the sense that they rarely produced a radically incoherent utterance and that they made great efforts to be relevant and often were. Yet, at the same time, we found that their propositions sometimes fell in a zone between irrelevant and completely relevant—a zone we call “proximal relevance.” That is, their utterances were at times roughly relevant but seemed to drift from the topic of the previous utterance or set of utterances.

For example, during dinner with his family, Adam, an 11-year-old boy with Asperger's Syndrome recounted a narrative about how his grandfather had taken him for the very first time on a bike ride on a busy street. Adam reports that when he and his grandfather returned home, his grandmother endlessly and mercilessly interrogated his grandfather about what happened and upbraided him for poor judgment. Adam repeats his grandmother's words many times in his narrative:

Adam: She said-
 she says—
 “This WAS the first time you were riding a bike.
 [WASN'T it, Philip?
 [((gesticulates with both hands))
 This WA:S isn't it?”

At a certain point Adam's mother interjects that the grandmother could be “a district attorney,” and his father agrees that she could be a “detective.” Adam listens intently but does not quite grasp the link between his description of his grandmother's accusatory grilling of her husband and his parents' comments. Instead, he agrees that she could be a detective because “she finds things easily” and “she looks for bargains in the supermarket.” These are indeed qualities associated with being a detective and hence relevant to the characterization of his

grandmother as a detective, but they are only proximally relevant to main topic in play related to Adam's account of his grandmother's interrogations.

Autistic sociality diminishes as the social coordination of both actions and propositions involves extended stretches of conversational actions and topical discourse. The high functioning children with autism or Asperger's Syndrome in our study had difficulty improvising a lengthy nonformulaic dinner prayer, cotelling a coherent narrative of personal experience, understanding the overall gist of a discussion. The sociocultural and interpersonal demands are heavier when one has to interpret an interlocutor's point of view in relation to the larger frame of actions and propositions that contextualize any particular action or proposition at hand. Autistic impairments in executive function and weak central coherence (e.g., Frith 1989; Frith and Hill 2004; Happé 1994a; Russell 1997) underlie autistic children's struggles in maintaining continuity of actions and propositions across extended social interaction.

To summarize, the ability to interpret and anticipate conversational actions is a basic form of autistic sociality and a cornerstone of human sociality more broadly. The language games, as Wittgenstein calls them, become more difficult to play as the game entails acts of relevance based on interpersonal attunement, contextual implicatures, and nested topics related to an overarching theme across an extended stretch of discourse. High functioning children with autism or Asperger's Syndrome use their intelligence to learn to play these language games and they often get by with fully or proximally relevant contributions. Their impairments are subtle yet consequential. Like ships that pass each other in the dark, sometimes these proximally relevant remarks pass by interlocutors unnoticed. Sometimes they are generously accepted. But in the social world outside family members and teachers, the proximally relevant, somewhat odd comments of autistic children sometimes confuse and annoy interlocutors.

Conversational Topic

Topic choice plays an important role in promoting or impeding orderly social coordination with children with ASD. Autism researchers and clinicians have noted that topics that interest autistic children tend to be drawn to objective knowledge, such as closed sets of objects, sequences, grids, and mathematical puzzles. When Adam, for example, recounts his first day at school for his mother, he notes exactly when the bell rings for the beginning and end of each class, as revealed in the excerpt below:

- Adam: The times when the period ends and the period starts are UNBELIEVABLE.
- Mother: Why? ((Laughing))
- Adam: The first period starts at eight-thirty-ONE, not eight-thirty, eight-thirty-ONE.
- Mother: Oh, that's interesting.
- Adam: And ends—
- Mother: Well, you know WHY, because they figure everybody's going to be in their class at eight-thirty.

Well does the bell ring at twenty-five after, or are you just supposed to be there at eight-thirty?

Adam: No, it rings at, rings at—there's three bells. One at twenty-seven after—

Mother: O.K., warning bell.

Adam: And then there's one at twenty-five and then one at twenty.

Mother: Oh, so you don't need a watch. ((Laughs))

Adam: Yup! ((Laughs))

Mother: If you all know what bell it is, yeah.
Well that help—that's helpful.

Adam: Yeah. And then, so, well, the first class,
Mrs. Brown's class, starts at eight-thirty-ONE, and ENDS—
you will think this is really crazy—at nine-twenty-EIGHT.

Mother: Oh, that's a long class.

Adam: Yeah. At nine-twenty-EIGHT.
And then—((Laughter in voice))

Mother: That's almost an hour.

Adam: Yeah. So then it ends at nine-twenty-eight.

Mother: Hmm.

Adam: So, then that's that.
And then so, at nine-twenty-eight,
I walked into Mrs. Kretsch's class. It's RIGHT by the office.
Right next door.

Although topics of this sort may lead children with ASD to spin off and neglect their addressee, they are instrumental in creating a domain of orderly social coordination with interlocutors such as the exchange with Adam's mother. Indeed some of the longest dialogues in our study were inspired by structured objective knowledge of interest to a child.

Alternatively, subjective, affective topics were more challenging for some children in our study. As would be predicted by autism researchers (e.g., Hobson 1988; Loveland et al. 1997), some had difficulty identifying their own emotions and at times produced responses that were only proximally relevant to the expressed feelings of others. For example, one morning Sylvester's mother lets out a long sigh and says to him, "It's a long morning isn't it?" Sylvester responds "Mmhm. Long morning and short night." This response displays an orientation to his mother's expressive comment but he does not directly respond to the affective meaning of the sigh combined with "long morning" as conveyed by his mother. Indeed, his mother seems puzzled by his response, asks him "What's that mean?" At this point Sylvester replies with a objective calendrical contrast between length of days in the summer and winter, saying "Mommy, in the summer there's long days and short nights. His mother shifts then to his topic, asking "What about the winter?" and he replies "There are short days and long nights." Emotion recognition, empathy, and interpersonal theory of mind impairments interfere with Sylvester's ability to provide a wholly relevant response

that orients to his mother's expressed weariness (e.g., Baron-Cohen et al. 1999). That is, these conditions position Sylvester and his mother and others invested in autistic sociality outside of the domain of orderly social coordination.

Corporeal Alignment

Our analysis of conditions that promote or hinder autistic sociality has thus far drawn on our study of high functioning children with autism. We turn now to our studies of severely impacted children with this disorder. These children have little or no speech, social eye gaze, facial expressions, or gestures; and little ability to initiate or sustain joint attention—all required for face-to-face social interaction (Geschwind and Levitt 2007).

In their discussion of human sociality, Enfield and Levinson (2006:2) justifiably position face-to-face bodily alignment as “the arena in which human sociality is centrally exercised.” Although face-to-face interaction is the primary locus for human sociality this bodily alignment warrants further scrutiny as the nexus of sociality for persons with neurodevelopmental disorders such as autism. Children with ASD are vulnerable to sensory overload when positioned in a face-to-face formation, especially when the head and eye gaze are oriented to attend to the face of the interlocutor and they tend to avoid this orientation (e.g., Klin et al. 2002). Yet, this orientation can be the protocol in institutional settings such as clinics and schools. Consider, for example, the video frame grab shown in Figure 4 that displays the face-to-face bodily alignment of a speech therapist and Lev, a nine-year-old boy with severe autism.

The therapist and an aide orient Lev's eye gaze toward the therapist's face and a flash card she is holding, on which is printed the name “Jamie.” The therapist is articulating the sound corresponding to the letter “j.” Her face and body are thrust forward toward Lev, and the card is positioned just below her chin. At the same time the aide braces Lev's head with one hand in a face-to-face alignment and holds his right arm down with the other hand. These efforts indicate how difficult it is for Lev to maintain this orientation and just how far these interlocutors are from a domain state of orderly social coordination.

Although securing the attention of a child severely impacted with autism is often very challenging, non-face-to-face alignments may optimize opportunities for social coordination for severely affected persons with autism in ways that face-to-face interaction does not. As such non-face-to-face interaction is an important condition in the algorithm for autistic sociality. Non-face-to-face interaction includes a broad range of possibilities, including, for instance, side-by-side and oblique orientation, as well as interaction that transpires out of sight at a distance, for example through writing. Face-to-face is somewhat of a misnomer, because interlocutors may have their bodies facing each other while their faces are not aligned as such. Their gaze may be oriented, for example, toward an object of interest, or elsewhere.

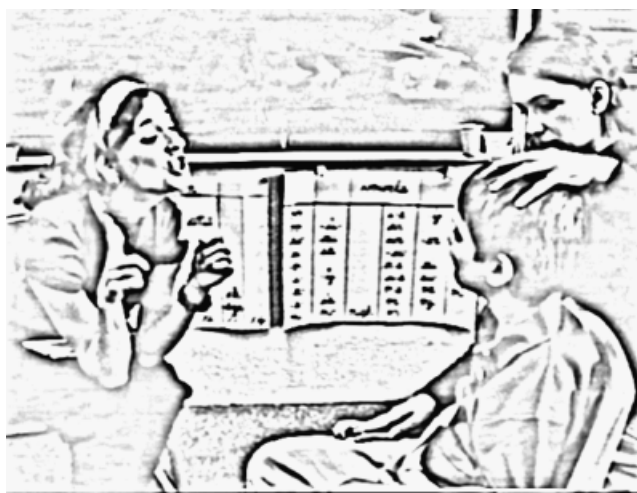


Figure 4. A face-to-face alignment.

Non-face-to-face alignments offer a different social playing field that is more congruent with the autistic child's social potentialities (Ochs et al. 2005). Non-face-to-face alignment distinguishes a method introduced by an educator from India, Soma Mukhopadhyay, who has had consistent success in realizing the social proclivities of autistic children. An important component of the method is to bring the child and interlocutor into a side-by-side alignment, as displayed in Figure 5.

In this interaction, Soma and Lev are sitting on a couch next to each other and both are gazing down at a letter board that Soma's holds in front of them. While Lev's gaze wanders, he is able to gaze at the letter board to which Soma orients his attention without someone bracing his head to do so.

Objects that Mediate Interaction

Related to the affordances of non-face-to-face alignments is another condition that promotes orderly social coordination with autistic children, namely, the use of physical objects to mediate social interaction. When Soma and Lev are sitting side by side, the letter board is an important player in bringing them together. The speech therapist's flash card (see Figure 4) is also an object of joint attention, but its placement so close to her face may have made it more difficult for Lev to attend to than the letter board (see Figure 5), which is positioned out of direct alignment with the face of the interlocutor. As such Lev gazes at the letter board and only the letter board without the overwhelming visual stimuli produced by the corporeal interlocutor. Across the autism spectrum communication through artifacts such as computers, telephones, or even pens and pencils enhance the possibility of autistic sociality. Gazing at a computer screen or piece of paper offers a domain of social coordination at a distance.



Figure 5. A side-by-side alignment.

In addition to artifacts, animals may also mediate social coordination with children severely affected by autism. For example, children who otherwise socially interact with great difficulty became socially animated when engaged in triadic interactions involving a specially trained dog and a trainer (Solomon this issue). The children responded to the trainer's instructions how to give the dog commands and participated for extended rounds of activity involving the dog and trainer. They also allowed their siblings and others to join dog-mediated activities. At times they turned to directly face the dog. Finally, the children expressed excitement and joy in these moments of animal-assisted sociality. In these ways, specially trained dogs afforded domains of orderly social coordination with children on the autism spectrum.

Communicative Medium

These observations also relate to how the medium of communication can organize social coordination with children who are severely impacted with autism. Although speech is the primary medium of human sociality for the neurotypical population, it is not necessarily the optimal medium for children with severe autism, most of whom have little or no productive speech. Most clinical interventions focus on developing severely autistic children's ability to speak as an *endpoint* of communicative competence, as in the speech therapy session depicted above. The therapist and aide endeavor to get Lev to pronounce the sounds that compose the name "Jamie" on the flashcard she holds in front of her, but Lev has great difficulty producing these sounds. When the therapist models the sound corresponding to the letter "J," Lev produces the sound/el/:

- | | |
|------------|--|
| Therapist: | ((turns to face Lev)) <u>Your</u> turn! |
| Lev: | ((looks down and to the right, away from the flashcard, pats right hand with left several times)) |
| Aide: | ((holds Lev's head to face therapist and flashcard, and points to flashcard, then holds down Lev's hands)) |

Try [Lev.
 L: / el / (“L”)
 T: Good TRY ↑ :: ING ↓

Yet, we have documented that severely impacted autistic children can communicate through other semiotic channels, like pointing at letters and numbers, in ways never achieved when speech is mandated. That is, pointing is not only a developmental precursor to speech but also an opportune semiotic alternative for enhancing severely affected autistic children’s potential for human sociality. Consider communication that transpires between Lev and Soma as they sit side by side looking at a letter board just a few weeks after Lev’s speech therapy lesson. The letter board is not only an object of their mutual gaze but also a technology for communication. Lev uses the letter symbols of the board to spell words that he wants to express. Lev points to letters to spell answers to questions posed by Soma. Soma’s questions focus on objective knowledge and are taken from workbooks covering school subject matter. In the excerpt below, Soma is teaching grammar to Lev. She asks him to fill in the correct missing word in the sentence that begins “The car is out of” and supplies multiple choice alternatives “gas,” “mad,” “bag,” and “sat.” As Soma continuously prompts him to keep his attention on task through language, touch, and jiggling the letter board, Lev points to the letters that spell out the word *gas*. Each time that Lev points to a correct letter, Soma repeats it in speech:

Lev: ((looks directly at and points with index finger to letter on letter board, then briefly glances sideways at Soma, then looks back at letter board))

Soma: ((shifts gaze from letter board to Lev’s face, then back to letter board, nodding))
 [“G ::”,
 ((looks at Lev))
 [very good ↑
 ((looks at letter board))

Lev: ((looking at and pointing to letter on letter board then briefly glances at Soma))
 [Ehn
 ((short pause))

Soma: ((shakes board)) What is it
 ((nodding, looking at letter board))
 [“A ::”,

Lev: ((lifts finger off letter board and glances at Soma then back to letter board))
 ((even voice)) Very good.
 “G” “A”?

Lev: ((points to letter on letter board and looks at Soma))

Soma: ((nods))
 [“S”,

Lev: ((looks at Soma, smiling))

Soma: ((looks down at workbook on lap))
 [“Gas”!

Soma: Very good!

Lev: ((looks away to left side))

- Soma: [((reading out loud from the workbook and writing the word “gas” in the workbook))
[“The car was almost out of gas”
- Lev: [((claps hands, looking away to left side))
- Soma: ((even voice)) Very good.

The level of communication in this exchange stands in striking contrast to Lev’s participation in speech therapy. Lev indicates that he understands how to respond to a request for information, that he knows the answer to the question posed to him, and that he can spell the answer. An additional striking feature of this dialogue is that Lev takes fleeting sideways glances at Soma after he points to a single letter, seeming to be checking for her assessment of his efforts. These glances indicate a level of orderly social coordination heretofore not attributed to children severely affected by autism.

Baby Talk

Another hurdle to enhancing autistic sociality among severely impacted children is the habitus of baby talk, which is used in adult–child communication as part of the speech repertoire of many communities in the United States and elsewhere. Parents and other adults using this register do so as a means of simplifying communication and creating an emotional bond with typically developing young children (Ferguson 1977). But a combination of the baby talk features of heightened affect and slowed tempo may prove to have the opposite effect for children with neurodevelopmental disorders such as autism. These characteristic features in tandem may conflict with autistic impairments in sensory processing and attention (e.g., Minshew et al. 2006).

These baby talk features pervade the language of the speech therapist as she addresses Lev and other children in her class. Stretching out the articulation of words is, of course, characteristic of the modeling of sounds in speech therapy. When the therapist demonstrates the target word “Jamie,” she produces each sound slowly and moves her jaw, tongue, and lips in a slow and exaggerated manner to demonstrate with great clarity how to articulate the sounds that compose the word. These efforts are accompanied by heightened affect in the form of widened eyes and frequent effusive praise uttered with exaggerated pitch contours, vowel lengthening, and increased loudness or dramatic whispered voice quality (“Good TRY ↑ :: ING ↓ !,” “GOO ↑ :: ↓ D!,” “((whispering)) Very nice ↑ try ↓ !”). Notice that Lev is showered with praise even when he fails to point at the correct symbol. Together with the fixing of Lev’s head and gaze direction in a locked face-to-face formation, these heightened affective features may overwhelm Lev and contribute to his difficulty in remaining focused for the duration of the whole task of pronouncing each sound in the word “Jamie.” As such, baby talk register is poorly designed for the interactional potential of children with severe autism. Family members and therapists tirelessly work to find the door to autistic sociality, but the door may be obscured by their abiding reliance on heightened emotion coupled with slowed speech as the path to orderly social coordination.

In contrast, video recordings of Lev and other severely autistic children indicate greater social engagement when interlocutors speak to them with restrained affect and in a moderate to rapid tempo. That is, autistic sociality seems to be afforded when interlocutors transcend baby talk register, as in the communicative approach of Soma Mukhopadhyay and other teachers and parents who have incorporated it into their repertoire when addressing a child severely affected with autism (Iversen 2006). When Soma praises Lev's correct (and only correct) responses, she often places emphatic stress on the word *good*, but it is produced rapidly and rhythmically as if to punctuate the end of a unit of action. Moreover, the pitch contours of her praises tend not to be exaggeratedly high or low but, rather, moderately rising and falling, and the amplitude of her voice moderately increases in loudness or remains at default levels (Engelke and Mangano 2007, 2008). A brisk, rhythmic clip is maintained throughout the task at hand, including delivery of information, questions, prompts to attend and proceed, and assessments. The restraint displayed, along with other features of this situation, may have the effect of drawing the children into active and orderly social engagement, as seen in Lev's ability to spell the answer to a test question and even glance sideways at his interlocutor to see if his response is correct at each step of its production.

These examples of social coordination involving children with severe autism, suggest that the "default interactional matrix" (Levinson 2006) for communicating with typically developing children may be poorly designed for the interactional potential of children with severe autism. Family members and educators tirelessly work to find the door to autistic sociality but the door is obscured by their abiding reliance on the habitus of face-to-face body alignment, speech as the primary medium for all interlocutors, and baby talk exaggerated pitch and stretching out the sounds of words as the path to social coordination.

An Algorithm for Autistic Sociality

In the realm of social abilities and impairments, children on the autism spectrum display a greater proclivity for sociality than commonly assumed. The range of possibilities for autistic sociality is shaped by the neurology of this disorder and one's place on the spectrum of severity of autistic symptoms. The actualization of these possibilities for social coordination, however, is organized in part by the communicative habitus of families, therapists, teachers, and other interlocutors with whom children with autism routinely interact.

Children with autism vary widely in their symptoms (American Psychiatric Association 2000), such that the portal into autistic sociality cannot be reduced to a single set of domain conditions that promote orderly social coordination (Danon-Boileau 2001, 2005). With this caveat in mind, our observations combined with other research generalizations lead us to propose an initial set of such conditions in the form of an algorithm for enhancing autistic sociality. This algorithm includes the features listed in Table 1.

The algorithm implies that the sociality of persons with ASD and the neurotypical population are not categorically distinct. Rather, autistic sociality waxes and wanes in relation to

TABLE 1. Algorithm for Enhancing Autistic Sociality

DOMAIN PARAMETERS	DOMAIN CONDITIONS PROMOTING SOCIAL COORDINATION
LANGUAGE	• CHILD'S FIRST LANGUAGE WITH FAMILY MEMBERS
CONVERSATION SEQUENCES	• SHORT SEQUENCES OF CONVERSATIONAL ACTIONS
TOPIC	• OBJECTIVE KNOWLEDGE
CORPOREAL ALIGNMENT	• NON-FACE-TO-FACE INTERACTION
MEDIATION	• ARTIFACTS AND ANIMALS TO MEDIATE INTERACTION
COMMUNICATIVE MEDIUM	• WRITING, POINTING, MUSIC (ESPECIALLY SEVERELY AFFECTED CHILDREN)
EMOTIONAL INTENSITY	• RESTRAINED AFFECT
TEMPO	• MODERATE TO RAPID

societal and interactional conditions. The sociality of those severely impacted with autism, for example, may be obscured by their lack of spoken language, but when allowed to communicate through other modalities, such as pointing to symbols, their sociality comes through. The socially inhibiting effects of default face-to-face alignment and affect-loaded baby talk have also been identified.

The algorithm has implications for the relative complexity of different forms of sociality for children with autism and by extension perhaps for humans more generally. A basic form of human sociality may, for example, consist of locally organized sequences of conversational actions, such as request and response. These moments of social coordination, brief as they are, evoke a sense that children across the autism spectrum are aware of and follow certain social conventions (sociocultural perspective taking) and as such can be players in the social world. More complex forms of social coordination may involve extended discourse in which propositions are relevant to an overarching idea or goal, such as when recounting a story or formulating a plan. Such discourse draws on executive function and other skills that are challenging to children with autism and others (Russell 1997). In these discourse conditions, the impairments of children with high functioning Autism or Asperger's Syndrome are subtle yet consequential. They require in-depth analysis of missteps in encoding and decoding context into the semiotic interaction at hand. Often their proximally relevant utterances pass by interlocutors unnoticed, or are received with a quizzical reaction, or, in the case of parents, teachers, clinicians, and close friends, with generous interpretive acceptance.

Every child is born equipped with a potential for social coordination, but some children are able to socially coordinate only or best under a narrow range of situational conditions. The algorithm for autistic sociality that we offer stipulates these conditions in an effort to enhance the social coordination potential of persons affected by autism.

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Notes

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The studies “The “Rapid Prompting” method of communicating with severely autistic children: a language socialization study” and “Animal Assisted Therapy as Socially Assistive Technology: Implications for Autism” were approved by the University of Southern California Institutional Review Board, Health Science Campus.

1. The data corpus consisted of approximately 100 hours of video recordings that were selected by the second author from a larger video archive collected by the Cure Autism Now Foundation.
2. Approximately 100 hours of video recordings were collected by the second author for a National Academy of Education—Spencer postdoctoral research project that followed several families participating in the Cure Autism Now foundation’s project, as well as families subsequently recruited in Los Angeles and Chicago.
3. All names used in this study are pseudonyms.
4. Transcription conventions adapted from Atkinson and Heritage 1984:

- . The period indicates a falling, or final, intonation contour.
- ⊔ The question mark indicates rising intonation as a syllable or word ends.
- ↑ The upward arrow indicates a rising intonation, usually in the middle of a word.
- ,
- ::: Colons indicate stretching of the preceding sound, proportional to the number of colons.
- A hyphen after a word or a part of a word indicates a cut-off or self interruption.
- word Underlining indicates some form of stress or emphasis on the underlined item.
- (()) Double parentheses enclose transcriber’s comments.
- () Single parentheses indicate that something is being said, but it is unintelligible.

- (1.2 sec. pause) Numbers in parentheses indicate pauses in tenths of a second.
- (.) A dot in parentheses indicated a “micropause,” hearable but not readily measurable.
- [Separate left square brackets, one above the other on two successive lines with utterances by different speakers indicates a point of overlap onset; also, simultaneous verbal and nonverbal behavior of one speaker.
- [. . .] Several lines omitted in the transcript.
- WORD Capitals indicate increased voice volume (loudness).
- Word** Boldface indicates relevance to the discussion. Free glosses of utterances in other language are provided by native speaker transcribers.

5. But see Toppelberg et al. 1999.

6. We add that our study of severely autistic children indicates that even severely impacted children with Autism who do not speak can sustain local sequences of actions when given the opportunity to engage in non-face-to-face interaction and to use semiotic resources other than speech, two interactional domains that are discussed in the remainder of this article.

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