Autism in Conversation:

Psycholinguistic Analysis of Dyadic Conversations of Children on the Autism Spectrum

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By

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Abstract

Despite the fact that individuals on the autism spectrum are perceived as awkward and lacking in social skills by typically developing (TD) peers, actual conversational difficulty in autism spectrum disorders (ASD) is less monolithic than previously thought. High functioning children with autism (HFA) have comparative success implementing syntactic and phonological rules, but unlike their TD peers struggle mostly with pragmatics (Baron-Cohen 1999). For example, in an interview setting, a child with ASD may struggle to generate utterances that involve both themselves and their interviewee such as, “I used to live in Boston too, but now I live in New York. Have you ever been to New York?” This study seeks to answer the following research questions: In conversation, are ASD kids responding to questions and generating them at a similar rate to TD peers? How appropriate are questions and responses between groups? How does the content of the responses and generated questions affect the conversation? Who speaks the most during an interview? Is it the interviewer (the child), or the interviewee?

Consistent with my hypothesis, autistic children generated more information in their conversations, and spoke longer than typically developing peers. These results indicate that autistic children are attempting engagement in conversation, but that engagement is perceived as egocentric, and irrelevant, which can lead to bullying and further limits socio-linguistic skills.
Autism in Conversation:

Psycholinguistic Analysis of Dyadic Conversations of Children on the Spectrum

Studying Autism Spectrum Disorder (ASD) has been of high interest within the field of developmental psychology as diagnosis of the disorder has greatly increased in the United States over the past few years (CDC, 2017). As it is defined by the DSM-5, Autism Spectrum Disorder (ASD) is a developmental and neurological disorder that affects social participation, effective communication, restrictive and repetitive behaviors or interests, and persistent deficits in social communication. Communication deficits are often difficulties with turn-taking behaviors, following ‘the rules of conversation’, that typically developing children (TD) acquire through typical language development (Daubert, 2014). Frequently language difficulties coincide with social isolation from peers. Social isolation by peers can lead to self-inflicted isolation, preventing further language development that would have occurred with social interaction and conversation (Boucher, 1984). Children on the spectrum continuously struggle with understanding facial cues and often are judged for responses that may not be considered appropriate, polite, or focusing on narrow and restrictive story-telling (Dean et al., 2013). Although there are deficits in both receptive and productive language, this study will focus on productive language.

Language development and social competence have an intricately connected relationship. Children, particularly pre-teens and adolescents, need to develop meta-linguistic competence in order to determine the intent and meaning behind new expressions, and to clarify any linguistic ambiguity (Adibi, 2010). Pragmatic success shares a connection with understanding the mental state of the conversation partner, which can be facilitated through the ability to attribute mental states, beliefs and desires to another person, or Theory of Mind (Surian, 1996). Theory of Mind
is the ability to attribute desires, mental states, or thoughts to another person, and understanding others have differing mental states than themselves, and in the case of dyadic interviews, Theory of Mind is tested by understanding that “there may be a difference between a speaker’s knowledge state and that of the listener” (Baron-Cohen, 1999, p. 408). Autistic children have deficits in Theory of Mind compared to their typically developing peers (Surian, 1996).

Despite showing relatively intact knowledge of syntax and morphology, most higher functioning children on the autism spectrum, those without intellectual disability, struggle in their pragmatic language capacity (Surian, 1996). Pragmatics is the study of how language obtains meaning aside from literal meaning through context (Birner, 2012). Children on the autism spectrum often struggle with the cognitive task of deriving meaning from context (Surian, 1996).

Within the field of pragmatics, there are several theories as to how we derive meaning from language. Grice suggested there are specific ‘Maxims’ of conversation that all speakers attempt to follow in a conversation: avoid redundancy, lying, impoliteness, and to be as informative as is possible and necessary (as reviewed in Surian, 1996). When tested for their ability to detect pragmatic errors in conversations, autistic children perform more poorly than their typically developing peers. Surian (1996) suggests that autistic children are ‘deaf’ to Gricean Maxims, which are suggested to be universal at least among native English speakers.

Presumably, in conversation all speakers operate under Brown and Levinson’s ‘Politeness Theory’, which claims that “politeness and the recognition and linguistic acknowledgement of much subtler threats to the self-image that a person presents publicly” (Birner, 2012 p. 201). According to Birner, within a discourse, the speaker considers the context in which they are speaking in order to present a certain self-image, and they also actively seek to
maintain the self-image that is most appropriate in that context. However, ‘threats to self-image’
are subject to the speaker’s discretion and interpretation. In other words, the speaker is the one
who makes choices in order to follow the ‘Politeness Principle’, but those choices are made on
their own interpretation of the need for specific speech acts within a conversation. Therefore, an
explanation for the supposed errors in productive speech for children on the autism spectrum
such as interrupting, not taking turns in a conversation, or asking inappropriate questions (Surien
1996), can be explained within the parameters of the Politeness Principle as the speaker not
perceiving the needs of the hearer or of the conversation at large.

Autistic children also tend to prioritize conversations with adults over conversations with
peers, which further limits their metalinguistic understanding of context and the importance of
considering the hearer when generating utterances. (Dean et al., 2013). These difficulties in
pragmatic understanding can lead to serious misunderstandings and group isolation for autistic
children, which in turn threatens further learning and development of meta-linguistic competence
(Adibi, 2010).

Although autistic children have difficulty with pragmatic understanding, there is evidence
in the literature that autistic children are capable of learning this information through
intervention and practice. Despite some children on the spectrum possessing narrow interests and
focuses of attention, turn-taking and other conversational strategies can be ‘trained’ with
successful intervention (Daubert, 2014). This training was based on a motivation rewards system
based on cards, where a child received a card with a favorite character of the child’s (Daubert
2014). Considering that pragmatics is the use of language within a specified context, it is
imperative to look at naturally occurring speech, in order to find evidence for pragmatic
understanding.
Past literature suggests children on the autism spectrum can overcome meta-linguistic difficulties in order to have a successful conversation, especially if they are ‘prompted’ in some way by the context, or their conversational partner. Autistic children have been shown to improve with “self-initiated verbal behaviors such as question-asking”, when presented with a reward, thus encouraging engagement with conversational partners (Koegel et al., 1998). However, improvement from intervention is connected to the “willingness to participate”, and inconsistency in “willingness to participate” in the structure of a dyadic conversation suggests there is a continuous scale for engagement within a conversation that is score-able and possible to study (Mathinos, 1991). Conversational behaviors were assembled into a scale, with higher scores associated with more metalinguistically sophisticated behaviors. In one study, scores on this scale were directly impacted by context as autistic children showed adaptable performance and investment in pragmatic understanding, social competence, and meta-linguistic competence, but spoke more than their conversational partner within a dyadic interview (Boucher, 1984).

Generating questions that are exo-centric and encourage response and participation from the conversational partner can be a difficult task for many autistic children. Generating unusual, original questions can affect the peer relationships of many autistic children, often leading to misunderstanding and bullying behavior directed towards the autistic child (Koegel, 1998). Questions are the “self-initiated verbal behavior” most often absent or infrequent in conversations with autistic children. Despite having difficulty generating original questions, autistic children are still very talkative in a conversation. Autistic children often contribute more information and speak longer than their neuro-typical peers (Boucher, 1984). These findings are seemingly at odds with the implications of the ‘Politeness Principle’, that a speaker is always considering how the listener perceives the speaker.
The current study will assess the pragmatic success of children on the spectrum as they assume the role of an interviewer and will compare their performance with a group of typically developing (TD) peers of comparable age. Because interviewers are tasked with generating the questions and topics for a conversation, I will be able to assess how children on the autism spectrum generate conversational topics and questions within a specific pragmatic context.

I hypothesized that participants with a diagnosis of Autism Spectrum Disorder (ASD) would speak more than the TD group and would provide more information; however, they would be less effective in conversation fluidity and understanding of appropriateness within their conversation. In order to test this hypothesis, I coded for the following pragmatic behaviors: Information, Responsiveness, Appropriateness, and On-Topicness. Additionally, I will also be analyzing the ratio of participant to interviewee speaking time.

I posited that the ASD group would have higher Information scores, similar responsiveness scores, but lower On-Topicness/Code Switching’ and Appropriateness scores as compared to the TD group. ‘Information’ scores how much more information is brought into the realm of conversation from the speaker. The Responsiveness measure scored how well the participant continued a conversation and how their responses encouraged follow up from their interviewee. The Appropriateness measure assesses how polite was the child’s speech. The On-topic-ness score measured how many times the child changed topic, how fluid each topic change was. I performed repeated measures ANOVAs to assess whether frequency of specific codes occurs differently in the two participant groups.

Additionally, I anticipated that ASD kids would have a higher ratio of speaking time as compared to the TD group. Autistic children often stay on specific topics for long periods,
limiting opportunities for engagement of a conversation partner (Boucher, 1984). I will perform independent t-tests to assess whether speaking time differs between the two groups.

Methods

Participants

The participants were a subset of a larger study at Emerson College and were recruited through parental support groups, online advertisements, school systems, and through relationships with several family support organizations. The participants’ ages ranged from 8 to 18 years. The ASD group ranged in age from 10 to 17 years ($M = 164.05$ months, 13 years), and the TD group had a range of participants ages 10 to 17 years ($M = 162.85$ months, 13 years). All had IQ scores within the normal range (see below). The final sample included 20 ASD and 20 TD, 15 males and 5 females with ASD, and 12 male and 8 female TD participants. The Emerson sample reflected the population gender bias for ASD 4:1, or as high as 5:1, based on the most recent CDC reports (CDC, 2017). The sample for this study was selected from the larger sample collected by FACE Lab.

In addition to a standard IQ test, data was also available on several standardized measures of language abilities including the Social Communication Questionnaire, and the Clinical Evaluation of Language Fundamentals. TD individuals were defined as those without reported developmental delays or difficulties in social communication or interaction, based on parent report and the Social Communication Questionnaire (SCQ; Rutter et al., 2003). The SCQ is a brief questionnaire used to rule out social communication deficits in TD participants. The SCQ is a standardized screen for ASD that scores for social language use, understanding of syntax and morphology, and other aspects of grammatically producing language. The cutoff score for the SCQ is 15, which suggests some form of social communication impairment. None of the
participants in the TD group had scores above 15 (M=2.5, SD= 5.93). Three participants scored below the cutoff in the ASD group (i.e., 14, 12, and 13), but their ASD diagnosis was confirmed by the ADOS (M= 18.5, SD=1.48). The SCQ scores were significantly higher for the ASD than the TD group (t(33)=10.44, p<.001).

The Kaufman Brief Intelligence Test (KBIT) is a measure of verbal and nonverbal intelligence and can be used in a variety of settings (Kaufman, 2014). The measure has a mean of 100, and a standard deviation of 15, therefore anything below an 85, or above 115 is outside of normal ranges. Performance on this measure demonstrates that all participants scored within the normal range of intelligence. The mean score for the ASD group was 116.19 (SD=18.43), and the TD group was 112.78 (SD=14.75); these scores did not differ between the two groups (t(34)=.66, p= .513).

The Clinical Evaluation of Language Fundamentals (CELF) is an assessment using visual stimuli to assess expressive language, language structure, and severity of language disorders (Wiig, 1992). The ASD group scored a mean of 110 (SD=17.27), and the TD group scored an average of 113.6 (SD= 15.56). This test’s focus on expressive language also provides information on pragmatic ability. The CELF scores did not differ between the two participant groups (t(34) =-.51, p= .559), indicating similar levels of expressive language ability.

All of the participants spoke English as their native and primary language. Neither group included individuals with frank neurological diseases (other than ASD), cerebral palsy, genetic disorders (e.g., Rett Syndrome, Tuberous Sclerosis), or significant dysmorphology without diagnosis, intellectual disability, or mild to moderate hearing loss in at least one ear. Participants with High Functioning Autism (ASD) met DSM-5 criteria for ASD and were diagnosed with the newly revised ADOS-2, and confirmed by expert clinical impression. Although we did not have
access to the ADOS scores, health care professionals, parents, and Emerson College’s FACELab confirmed the diagnoses.

**Procedure**

In this study, language samples were elicited from a larger structured dyadic interview. In order to assess pragmatic asynchrony, it was important for the data to be from naturally occurring language samples, because pragmatic meaning is inherently derived from conversational context. In the larger study, each participant was first interviewed by the research assistant (RA) and then the participant was given the task of interviewing the RA. Our analysis focuses on this latter half of the structured interview during which the participant interviewed the RA. Because the design of this structured interview had the RA first interview the participant, participants had a model for how to interview another person. Additionally, each participant was presented with pictures of the RA to scaffold question and response development.

**Transcription:**

The participants’ data from this structured interview were collected in FACELab in Emerson College over the past year. The video recordings of the interviews were imported into ELAN (EUDICO Linguistic Annotator), a freely available software package that allowed for transcription of the interviews with millisecond precision in timing throughout the conversation. The language produced by each speaker during each interview was transcribed in full, and each section of speech, or meaningful vocalization from a participant was considered an utterance. These vocalizations were words and sentences, but also other meaningful forms of speech, such as gasps, laughs, sighs, “um’s”, etc. Because the meaning of utterance is subjective within the field of linguistics, I operationally defined utterance as a speaker’s main clause and subordinate clauses without a 0.04-second pause in between speech. This definition is based on previous
work on the analysis of discourse structure, rather than phonological or syntactic change (Prince, 1992). It was imperative that I operationalized an utterance for this specific study, in order to avoid confusion for the coders. Some studies rely exclusively on the presence of pauses between speech for utterances; however, considering that our study was not focused on asynchrony of syntactic construction or phonological production, it was crucial to define an utterance in terms of pauses, but also with connected clauses.

**Behavioral Coding:**

Three coders were recruited to code each utterance produced by each child participant in each interview; they were trained on the coding system developed for this study. Each utterance received a score for each of the four pragmatic language measures: Information, Responsiveness, On-Topicness, and Appropriateness (see appendices A, B, C, D, and E for the complete coding scheme). Coders did not know the diagnosis of the child; however, they were informed of the age of the child so that they could determine whether the child was speaking at an age appropriate level more effectively.

**Measures**

Participant language from the second half of the interview was assessed by a qualitative coding system for four variables: Information, Responsiveness On-Topicness, and Appropriateness. The ‘Information’ and ‘Responsiveness’ measures were adapted from Adibi’s 2010 study, as well as the definitions used by Mathinos (1991). I adapted them with my coders during reliability training to ensure that we were coding for the accurate linguistic behaviors. Below I describe the measures for ‘Appropriateness’, and ‘On Topic-ness/ Code Switching’, ‘Information’ and ‘Responsiveness’.
Information

The Information measure measured the content of responses and was on a scale of 1 to 5. Higher scores represented more complex information given, whereas lower scores were given for brief or repetitive utterances or ignoring the RA. ‘Information’ scores how much more information is brought into the realm of conversation from the speaker. ‘New’ information are statements not previously stated by or referred to by the speaker during earlier parts of the conversation (Prince, 1981). Because our data are derived from transcriptions of the child interviewing an experimenter, any new information introduced by the child would be coded as ‘new information’. Pragmatically speaking, a successful interviewer would be more concerned about eliciting new information from their interviewee, rather than providing new information from themselves, therefore a high score in Information would indicate poor pragmatics within this discourse context. All statements receive an information score; ‘fillers’ and short statements such as confirmations such as “yes/ um, etc.” would receive scores of 2 because they signal participation in the conversation. If the participant expands on a topic that is discussed by their interviewee, that is given a higher score, as it signals high meta-linguistic understanding. If a child provides information that is brand new, without any anchoring material that prevents interviewee response, that child would have more low scores. Consider the following example:

Interviewee: My favorite sport to play is football.
Participant: How many video games do you think I play?

In this case, the participants would score a one on information, because it ignores the context of the conversation, and introduces a new topic without aiding their interviewee. Consider the following example:

Participant: Do you play any sports?
Interviewee: I do! I like to play football.
Participant: I never liked football. Did you like it?
This participant would score a four for information because it not only encourages more information from the interviewee, but it also provides information about the speaker that is appropriate and on topic within the conversation.

**Responsiveness**

The Responsiveness measure scored how well the participant continued a conversation and how their responses encouraged follow up from their interviewee and was on a scale of 1-4. ‘Responsiveness’ scores the participants’ awareness and adaptability to a living conversation and to the needs of their conversational partner. Statements and questions that are egocentric and do not actively attempt to elicit responses from their interviewee are scored lower on the measure scale. Responsiveness tests the participant’s awareness and capacity to respond to their interviewee in a way that encourages more responses from the interviewee. Each utterance receives a responsiveness score because the first utterance in each of the conversations is the interviewee, so the participant will always have dialogue so they can respond. Low scores are given for behaviors such as ‘fillers’, such as ‘um’, ‘yeah’, or ‘mhm’ or statements that do not allow the interviewee to respond. Consider the following example:

*Interviewee: My favorite subject in school was math*
*Participant: Cool.*

The conversation above does not encourage a response from the interviewee; it would receive a one because it is a simple reinforcer. In contrast, if the child followed up with their reinforcer by saying, “that was my favorite subject too”, or with a clarifying question that would elicit a higher score.

**On-Topicness/ Code Switching**
The On-topic-ness score measured how many times the child changed topic, how fluid each topic change was, and was on a scale of 1-4. The ‘On-Topicness’/ ‘Code Switching’ measures assess the participants’ conversational fluidity. The tendency towards narrow focus of attention in interests has been correlated with poorer pragmatic function, through the difficulty in generation of new and relevant topics to speak about with a conversational partner (Daubert, 2014).

We operationally defined “The Topic” as “learning about the interviewee”. The coded transcription begins by the RA informing that child it was their task to learn more about them. This is an important distinction to make when considering that what the child believes to be “on-topic”, might not always be so. For example, the child may begin a tangential conversation where they talk about their favorite thing to do in the summer, ignoring that their task is to learn about the RA. This would receive a lower score, because it deviates from the overall ‘topic’ of “learning about the interviewee”.

The child may ask brand-new questions, similar questions to the ones they were asked in the first half of the transcription where they were interviewed by the RA, or they refer to photographs presented by the RA of them doing various activities for the child to refer. The information from the photos are therefore introduced as possible topics for conversation and would be considered “on-topic” for the conversation. A low score might also be obtained based on a lack of natural flow from topic to topic. In other words, if a child generates an egocentric topic that is completely unrelated to the topic mentioned before, the child will score more poorly. However, unlike the Responsiveness measure, On-Topicness does not assess the participant’s ability to elicit responses from their conversational partner, rather it examines whether the speaker is currently on topic. For example, a laugh or a ‘filler’ would receive a higher score of a
three on the On-Topic measure because the speaker is continuing the topic, whereas these behaviors would receive a two or lower for Responsiveness. In addition, higher scores are associated with encouraging elaboration from the interviewee on a current topic, in order for the participant to learn more from their conversational partner. Consider the following example:

Participant: What is happening in this picture?
Interviewee: My brother and I were playing soccer and we fell face first in the mud! *LAUGHS*
Participant: *LAUGHS*

The laughter is on topic; it would receive a score of three because the topic involved the interviewee laughing at something funny that had happened. The participant’s response would receive lower Information and Responsiveness scores, but a high On-Topicness score.

**Appropriateness**

The Appropriateness measure was scored based on how appropriate the child’s speech was and was on a scale of 1-4. In other words, was the child speaking to the adult RA in a way that would be considered polite in general conversation among native speakers of English in the United States? We acknowledge that children can often be unpredictable in speech, so this measure assesses not only what is considered ‘polite’, but also what would be typical for a child in that age group.

Politeness is often cited as problematic for autistic children. This scale gives the child a score based on the potential invasiveness and formality of their questions. The child is interviewing an adult RA they have only just met earlier that say, therefore their questions should reflect what is largely considered appropriate formality among native English speakers in the United States. Scores 1 and 2 note the failure of the child to ‘code switch’, or to modify their speech with the metalinguistic understanding that they have to be polite in their conversation.
These statements are what people would consider highly personal or intrusive questions such as “Do you have a boyfriend?”, or highly personal information about the speaker such as, “My parents fight a lot”. ‘Fillers’ can be considered for a high appropriateness score because they prevent this type of invasion of privacy of the interviewee.

**Ratio of Speaking Time**

Each participant’s transcription allowed for an accurate assessment of how long each speaker was speaking in relation to the total length of the conversation. Considering that the conversation is an interview, it is likely that the RA would be speaking more than the child. If the child is speaking more, then there is evidence for an imbalance in contribution to the conversation.

Data for each participant consisted of ratio of the cumulative frequency of codes assigned across all of his/her utterances in the conversation divided by that participant’s total number of utterances. For example, for Information there were five possible codes. The total number of “1”s, “2”s, “3”s, “4”s and “5”s assigned by the coders across all utterances for each participant was then tallied and the ratio of this total frequency divided by the total number of utterances made by that participant was entered into the statistical analyses. I hypothesized that ASD participants would have higher Information scores, similar Responsiveness scores, but lower On-Topicness and Appropriateness scores as compared to the TD group. Additionally, I anticipated that ASD participants would have a higher ratio of speaking time as compared to the TD group.

**Results**

Inter-rater reliability was established between coders through a series of practice coding of four pairs of participants. Between each round, there were meetings between coders and myself to discuss any confusion that resulted in disagreements, and adjustments to the coding
scheme were done accordingly, until satisfactory reliability was established. Reliability was achieved with coders 1 and 2; coder 3 could not establish reliability and he was dropped from the coding task. The range for ICCs for the Information measure were ICC=.937 to 1.00. The range for ICCs for the Responsiveness measure were ICC=.888 to 1.00. The range for ICCs for the On-Topicness measure were ICC=.724 to 1.00. The range for ICCs for the Appropriateness measure were ICC=.303 to 1.00 (See Table 1). The Appropriateness ICC=.303 was the result of one coder who was dropped from the study. His frequent disagreements with the other two coders prevented us from establishing reliability with all three coders, so it was narrowed to the two who were able to establish reliability successfully.

In order to compare coding between groups, a repeated measures mixed ANOVA with code (1-5 for Information; 1-4 for other measures) as the within subjects factor and group as the between subjects factor was performed on each of the four coding measures to test for group differences in frequency of scores between the ASD and the TD groups. The ANOVA was performed on the proportion of a participant’s total utterances that were coded a specific numeric score. Proportions were used because each participant produced a different number of utterances. Note that each utterance was given a single numeric code for each of the four coding measures. Analyzing group differences in how often a participant produced 1s or 2s, compared to higher scored, more elaborative responses, would be evidence in support of different levels of meta-linguistic and socio-linguistic competency.

For the measure of Information, there was a main effect of score \((F(4,152)= 215.890 p<.001, \text{partial eta squared}= .850, \text{observed power} = 1.00)\). This main effect with a large effect size indicated that across the two groups, that the TD group scored 1s more frequently, and the ASD group scored 3 more frequently. There were no differences in the frequency of scoring a 1,
2, 4, or 5 (see Figure 1). There was a significant group by score interaction ($F(4, 152)= 2.97$, $partial \eta^2 = 0.73$, observed power = .784). This effect had a medium effect size. To explore the significant interaction, we performed pair-wise comparisons to test for group differences at each score. Those tests indicated that the TD group produced more utterances scored at the level 1 than the ASD group ($p<.05$, difference $= -0.067$ with a 95% CI $[-0.143, -0.005]$) (see Figure 1).

For the measure of Responsiveness, there was a main effect of score ($F(3,144)= 305.55$, $p<.001$, $partial \eta^2 = .89$, observed power = 1.00). This main effect had a large effect size. The TD group scored 2 more frequently, and the ASD group scored 3 more frequently. There were no differences in the frequency of scoring a 1 or 4 (see Figure 1). There was a significant group by score interaction ($F(3, 144)= 4.090$, $partial \eta^2 = 0.097$ observed power = 0.035). This interaction had a large effect size. To explore the significant interaction, we performed pair-wise comparisons to test for group differences at each score. Those tests indicated that the TD group had more utterances scored at the level 2, than the ASD group ($p<.05$, difference $= -0.094$ with a 95% CI $[-0.168, -0.020]$) (see Figure 2).

For the measure of On-Topicness, there was a main effect of score ($F(3,114)= 892.407$, $p<.001$, $partial \eta^2 = .959$, observed power = 1.000. This main effect had a large effect size and indicated that The ASD group scored 1 and 2 more frequently, and the TD group scored 3 more frequently. There were no differences in the frequency of scoring a 4 (see Figure 3). There was a significant group by score interaction ($F(3, 3.733)= 3.73$, $partial \eta^2 = 0.089$, observed power = .797.) This interaction had a large effect size. To explore the significant interaction, we performed pair-wise comparisons to test for group differences at each of the
levels. Those tests indicated that the TD group had more utterances scored at the level 3, than the ASD group (p<.05, difference -.024 with a 95% CI [-0.159, -0.024]) (see Figure 3).

For the measure of Appropriateness there was a main effect of score (F (3,114) = 899.07, p<.001, partial eta squared= .96 with an observed power of 1.000). The main effect for score had a large effect size. The ASD group scored 1 and 2 more frequently, and the TD group scored 3 more frequently. There were no differences in the frequency of scoring a 4 (see Figure 4). There was a significant group by score interaction (F(3, 7.53)= 3.73, partial eta squared= 0.165, observed power = .98) indicating a large effect size. To explore the significant interaction, we performed pair-wise comparisons to test for group differences at each of the levels. Those tests indicated that the ASD group had more utterances scored at the level 1, than the TD group (p<.05, difference -.05 with a 95% CI [-0.00, -0.07]), the ASD group had more utterances scored at the level 2 (p<.05, difference -.06 with a 95% CI [-0.003, -0.112]) (see Figure 4) and the TD group had more utterances scored at the level 3 (p<.05, difference -.002 with a 95% CI [-0.187, -0.044]).

To compare participant speaking time between the ASD and the TD groups, independent samples t-tests were performed. There was no significant difference in the RA’s speaking time across the two groups (t(38)=4.894, p=.001) (see Figure 5). However, the ASD group spoke significantly more (M= 109147.35, SD =44606.94) than the TD group (M=58711.45, SD = 42586.13; t (38)= 3.657, p=.001). The ratio of participant speaking time to total conversational length revealed that the ASD group had a higher ratio of speaking time in comparison to the TD group t(38)=4.496, p=.001(see Figure 6).
Discussion

I hypothesized that children on the autism spectrum and typically developing children would have similar conversation flows; however, autistic children would generate more information in their conversations, and speak longer than typically developing peers. The results were largely consistent with these predictions. The ASD group produced more utterances that were scored higher on the Information measure, and more utterances that were scored lower for On-Topicness and for Appropriateness measures as compared to the TD group. In addition, there was a group difference in ratio of speaking time, where the ASD group had a higher ratio of speaking time, as compared to the TD, but there was no significant difference in RA speaking time. The one measure where my hypothesis differed was in the Responsiveness measure, where the TD group produced more utterances that were scored lower than the ASD group.

The Information measure differs slightly from the other measures in that it does not necessarily reveal higher meta-linguistic competence within a dyadic interview scenario. The measure’s scoring system is based on how much new information the participant introduces into the conversation, and how sophisticated that information is developed. In an interview setting, the interviewer’s task – in this case the participant - is to learn about and elicit information from their interviewee. The TD group more frequently scored 1, compared to the ASD group, indicating that their utterances had less content (see Figure 1). However, as defined in the coding scheme, this implies that the TD group produced more utterances that could be classified as “reinforcers”, such as “okay”, “yes”, “I see”, etc. (see Appendix B). These kinds of statements acknowledge the interviewee’s utterances while allowing space for the interviewee to give more information and shows evidence of metalinguistic knowledge on behalf of the interviewer. By contrast, higher scores indicate that a participant is making more statements with more content,
and therefore potentially taking up more space in the conversation. Thus, results for Information suggest that ASD participants were introducing more information into the conversation than TD participants were, which is less compliant with metalinguistic rules for conducting an interview.

The results of the Responsiveness measure contradicted the original hypothesis that the TD and the ASD groups would score similarly. Responsiveness measures how aware the speaker is of what was said before in the conversation, and how well that speaker used previous information to build and elaborate for a conversation. The TD group more frequently scored 2’s, which, according to the coding scheme, indicates not completely succeeding as a responsive participant (succeeding would be at least a 3 for all measures). More frequently earning 2’s indicates that the TD group more frequently gave “reinforcer statements”, and stayed on the same topic as presented. These are statements such as “yes”, “uhuh”, but also includes statements such as “I know”. All of these utterances maintain the topic and minimally acknowledge the conversational partner. The results suggest that the TD group tended to accommodate their interviewee, through maintaining topics provided by their interviewee, rather than more frequently suggesting new topics. Alternatively, these results could also point to the TD group needing more direction from the RA (see Appendix B).

On-Topicness measured how well the participants stayed on topic, and how fluid changes in topic were. I observed that the TD group more frequently scored 3’s in the On-Topicness measure, which is consistent with the original hypothesis. The results indicate that the TD group more frequently successfully maintained the current topic, and did not often change the topic, regardless of whether the change was effective. Conversely, the ASD group was more likely than the TD group to attempt to change the topic, by introducing new topics for the interviewee to respond to, asking questions about pictures of the RA, or asking new questions that were not
mentioned in earlier parts of the interview. Although the two groups may be attempting a similar amount of topic changes, the TD group is seen as more frequently conducting a fluid and ‘natural’ topic change that allows space for the RA to respond and continue. Additionally, these results also indicate that the TD group more frequently repeated information that was said before, or used questions that were asked before in the first half of the interview where the RA interviewed the child.

Appropriateness showed the most significant group interactions, all consistent with the original hypothesis. The ASD group more frequently scored 1’s and scored marginally more 2’s than the TD group. These results indicate that the utterances made by participants in the ASD group were more likely to be construed as “rude” or “inappropriate”. ASD participants were more likely to make pointed laughs at the RA, or ask personal questions such as, “Where do you live?”, or questions that could be considered rude such as, “Why do you look so weird?” Participants in the ASD group were more likely to be perceived as uttering responses that could elicit a defensive response from the RA. Additionally, these utterances were perceived to come from a place of presumed familiarity on behalf of the interviewer and the ASD participants would ask overly personal questions (see Appendix B). In addition, the results indicated that the TD group more frequently scored 3’s on the Appropriateness measure. The TD group was more likely to ask questions that were open ended and gave the interviewee flexibility in how much they wanted to reveal about themselves. A 3 is also considered the lowest score in which a child is being typically “polite” or “appropriate”, meaning that the participants in the ASD group were more likely to be perceived as rude or invasive than individuals in the TD group.

The ASD group spoke more than the TD group, with no significant differences in the RA speaking time. These results suggest that the participants in the ASD group are spending more of
the interview time speaking. Considering the frequency of scores in the other measures, this extra speaking time is more likely to be filled with introducing new topics, because of their lower On-topicness scores. The ASD group’s higher Information scores point to more frequent elaboration on specific statements by providing more information than might be relevant to the conversation.

There are some limitations to this study. There was a challenge in determining reliability for Appropriateness, which was expected, as it is the most context-dependent of the measures. Appropriateness is the measure most subjective to personal opinion and is therefore most difficult to operationalize. Grice’s Maxim’s are open-ended to reader interpretation (Surian 1996). The Maxim of Politeness is described as “being polite”, which is culturally bound (Surian 1996), and dependent on the threshold of the individual speakers, as well as the threshold of the coders in the case of this study. All of these factors contribute to the relatively greater difficulty in establishing reliability for the measure of appropriateness.

To increase both reliability and validity of the pragmatic language measures, it may be worthwhile to create a separate measure for scoring laughter, or to exclude laughter from coding, as it can be easily misconstrued out of context. A separate measure for the function of laughter within a conversation would be useful. In addition, participant nervousness was also discussed as a potential confounding variable. The participants in both groups were children asked to speak to an adult they did not know in a lab setting, which could result in feelings of nerves that could have affected their speech and conversational abilities.

The findings of this study support the notion that, during a naturalistic conversation, children on the autism spectrum are more likely to speak more and about more topics in greater detail, but struggle in conversational fluidity, and understanding of metalinguistic knowledge of how to be appropriate, and be more likely to be perceived as rude by their conversation partner.
These difficulties could be the result of increased difficulty in self-generating speech, and greater interest in more egocentric topics. However, it is important to note that autistic children still sought engagement with their interviewee, but, as the results of the measures indicate, their attempts at engagement were not always perceived as successful or relevant. Refining coding systems such as this could have great implications in intervention strategies for speech therapy for high-functioning autistic children. Identifying specific verbal behaviors where a child is challenged, can allow for more tailored therapy.
Acknowledgements

I want to gratefully acknowledge the support of the Jerome A. Schiff Fellows Program and the Provost Undergraduate Research Fellowships for funding my research this summer. I would like to thank Brandeis University and the Psychology Department, as well as the Child and Adolescent Research and Development (CARD Lab) for my rigorous education, challenges, and opportunities. I would also like to thank my advisor, Dr. Teresa Vann Mitchell, for guiding me through my first independent research project, and the wonderful people at Emerson’s FACELab, Dr. Ruth B. Grossman and Dr. Emily Zane. Additionally, I would like to thank my second reader, Dr. Ellen J Wright for the advice and guidance in my project. I also have to thank my amazing coding RAs, Eirian Siegal-Botti, Emily Kalver, and Derek Scullin, for all of their hard work, and enthusiasm.
References


Table 1.

**Average measures intraclass correlations for the reliability training set.**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Information</th>
<th>Appropriateness</th>
<th>Responsiveness</th>
<th>On-Topicness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ICC = .989, 95% CI [.976 to .995] (F(25, 25) = 94.120, p &lt; .001).</td>
<td>ICC = .00, 95% CI [-1.230 to -.552] (F(25, 25) = 1.00, p &lt; .001).</td>
<td>ICC = 1.000, 95% CI [1.000 to 1.000] (F(25, 25) = N/A)</td>
<td>ICC = 1.000, 95% CI [1.000 to 1.000] (F(25, 25) = N/A)</td>
</tr>
<tr>
<td>2</td>
<td>ICC = .987, 95% CI [.977 to .993] (F(44, 44) = 78.956, p &lt; .001).</td>
<td>ICC = .936, 95% CI [.993 to .965] (F(44, 44) = 15.545, p &lt; .001).</td>
<td>ICC = .980, 95% CI [.964 to .989] (F(44, 44) = 49.889, p &lt; .001).</td>
<td>ICC = .992, 95% CI [.985 to .995] (F(44, 44) = 118.545, p &lt; .001).</td>
</tr>
<tr>
<td>3</td>
<td>ICC = 1.000, 95% CI [1.000 to 1.000] (F(56, 56) = N/A)</td>
<td>ICC = .914, 95% CI [.855 to .950] (F(56, 56) = 11.691, p &lt; .001).</td>
<td>ICC = 1.000, 95% CI [1.000 to 1.000] (F(56, 56) = N/A)</td>
<td>ICC = .885, 95% CI [.805 to .932] (F(56, 56) = 8.714, p &lt; .001).</td>
</tr>
<tr>
<td>4</td>
<td>ICC = .991, 95% CI [.986 to .995] (F(72, 72) = 117.254, p &lt; .001).</td>
<td>ICC = .664, 95% CI [.464 to .889] (F(72, 72) = 2.972, p &lt; .001).</td>
<td>ICC = .971, 95% CI [.954 to .982] (F(72, 72) = 34.671, p &lt; .001).</td>
<td>No Variance; coders agreed on 100% of trials and all utterances received the same score.</td>
</tr>
<tr>
<td>5</td>
<td>ICC = .937, 95% CI [.868 to .970] (F(29, 29) = 15.886, p &lt; .001).</td>
<td>ICC = 1.000, 95% CI [1.000 to 1.000] (F(29, 29) = N/A)</td>
<td>ICC = .963, 95% CI [.923 to .983] (F(29, 29) = 27.207, p &lt; .001).</td>
<td>No Variance; coders agreed on 100% of trials and all utterances received the same score.</td>
</tr>
<tr>
<td>6</td>
<td>ICC = .989, 95% CI [.975 to .995] (F(25, 25) = 90.600, p &lt; .001).</td>
<td>ICC = .303, 95% CI [.555 to .687] (F(25, 25) = 1.434, p &lt; .001).</td>
<td>ICC = .888, 95% CI [.751 to .950] (F(25, 25) = 8.960, p &lt; .001).</td>
<td>ICC = .724, 95% CI [.385 to .876] (F(25, 25) = 3.629, p &lt; .001).</td>
</tr>
<tr>
<td>7</td>
<td>ICC = 1.000, 95% CI [1.000 to 1.000] (F(50, 50) = N/A)</td>
<td>ICC = 1.000, 95% CI [1.000 to 1.000] (F(50, 50) = N/A)</td>
<td>ICC = 1.000, 95% CI [1.000 to 1.000] (F(50, 50) = N/A)</td>
<td>ICC = .960, 95% CI [.930 to .993] (F(50, 50) = 25.080, p &lt; .001).</td>
</tr>
<tr>
<td>8</td>
<td>ICC = .981, 95% CI [.967 to .989] (F(55, 55) = 51.491, p &lt; .001).</td>
<td>ICC = 1.000, 95% CI [1.000 to 1.000] (F(55, 55) = N/A)</td>
<td>ICC = 1.000, 95% CI [1.000 to 1.000] (F(55, 55) = N/A)</td>
<td>ICC = 1.000, 95% CI [1.000 to 1.000] (F(55, 55) = N/A)</td>
</tr>
</tbody>
</table>
Figure 1. Proportion of utterances for each level of the variable Information, plotted by group. (* = p < .05)

*Scores that differ significantly between the two groups are noted with an asterisk
Figure 2. Proportion of utterances for each level of the variable Responsiveness, plotted by group. (* = p < .05)
Figure 3. Proportion of utterances for each level of the variable On-Topicness, plotted by group. (*= p < .05)
Figure 4. Proportion of utterances for each level of the variable Appropriateness, plotted by group. (*= p < .05)
Figure 5. RA and participant speaking times, plotted by group. (∗= p < .05)
Figure 6. Ratios of Participant speaking times/total conversation time, plotted by group. (*= p < .05)
Appendix A

Pragmatics Coding System

**Coding Rules and Notes:**

**What is considered on Topic:**

Questions from first half of conversation:

1) Tell me about what you like to do for fun
2) Tell me about your family
3) Do you have any pets?
4) What is your favorite vacation or trip that you’ve taken?
5) What is the hardest or least favorite thing to do in school?

Pictures from the usual RA (not always this RA):

1) RA in Italy by the Coliseum
2) RA with her Rugby team
3) RA graduating

The overall “topic” is “learning about the RA”. The child’s utterances should be focused on learning as much as they can from the RA as possible, and less focused on educating the RA about themselves, as they have already done that in the first half of the interview which we do not code for.

Code Switching= We all speak differently when speaking to parents, friends, strangers, etc. “Code switching” is the metalinguistic task of adapting one’s speech to their conversation partner. “Failure to code switch” is when a child speaks in a manner that is not typical or polite when speaking to an adult stranger (the RA).

Grice’s Maxim of Manner= Avoiding obscurity and ambiguity. For our purposes, the child should be asking questions and making statements that are clear to the interviewee.

Interviewer= Child

- only code for these utterances

Interviewee= RA

Utterance 1= first utterance after interviewer says “So I’ve learned a lot about you”

XXX is just considered null. Is not coded with anything
Laughter and Sighs count as responses and therefore as their own utterances if they are in their own brackets in ELAN

*Everything in the photos of the RA, and the previous halves’ questions are considered “on-topic”*
Appendix B

Information (1-5)
From low to high nature of information

*Information scores are not necessarily trying to elicit new information from the interviewee
*New information and content added to the conversation

<table>
<thead>
<tr>
<th>Score</th>
<th>Score Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reinforcer statement</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Simple Statement</strong></td>
<td>2</td>
</tr>
</tbody>
</table>
| Expanded | 3 | A meaningful statement which goes beyond simple statement or provides a clarification of the subtopic under discussion (e.g., I have a green house, mine is blue and we have got a swimming pool).

Must add a new fact, not simply a restatement of a concept or elaboration from before (i.e. The following would NOT qualify for a 3 score= Child: “The brain is very mysterious” RA: “Yes” Child: “It’s its own fantasy”)

Can be a conversation starter, i.e. introducing a new topic. If the interviewer is introducing a new topic, and the information is unrelated to the previous utterance, this is considered new information, but also still expected within the environment of an interviewer. (i.e. “What is your least favorite vacation?” previous utterance was about pictures) |
| Elaborated | 4 | A statement that both respond to a preceding utterance and implies or demands a response from the partner (e.g., Do you like softball? Not as much as baseball, which do you like better?). Can be a question. |
| Sophisticated | 5 | A statement that includes all of the above with the addition of more abstract and sophisticated information or vocabulary that is very clear and understandable or a comply request that requires a more elaborated follow-up response from the partner. Can be a question. |
Appendix C

Pragmatics Coding System

<table>
<thead>
<tr>
<th>Responsiveness</th>
<th>Score</th>
<th>Scores Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-Topic Response</td>
<td>1</td>
<td>A response that does not address the chosen topic (e.g., Music, movies, sport, technology), or loses train of conversation or does not show understanding. Can be a laugh or a sigh, if seemingly unprompted and inappropriate. These are instances where the child does not demonstrate that they are listening to their interviewee by a disconnected response. (e.g., a child laughs when the RA explains the task)</td>
</tr>
<tr>
<td>Maintenance response</td>
<td>2</td>
<td>Minimal response that is meant to keep to the chosen topic with no elaboration. (I know, right). Or an assertion (yeh. Mhm, okay). Can be a laugh or a sigh. These laughs can be laughs that are “saving face” (e.g. laughing at one’s own mistake), or an awkward laugh as the interviewer is thinking of something to say (this is a typical behavior), or as a response to the interviewee’s laughter or joke. If there is a substantial pause, and the interviewee (RA) attempts to redirect the conversation back to asking them questions, and the interviewer (Child) resists, the utterance receives a 2 responsiveness score A statement such as “I’m done”, “I don’t have any other questions”, or any other attempts to prematurely end the conversation that is NOT a response to the interviewee asking, “Do you have any more questions?”</td>
</tr>
</tbody>
</table>
| Expanded response | 3 | A response indicating a person’s awareness of interaction and may or may not provide any new information or indication of responsiveness (e.g., Football is my favorite sport to watch). Or a simple contingent response that may not include any additional information (e.g., I have a green house, mine is blue. *Conversation about baseball* What’s your favorite baseball team? What are you doing in this photo? What is your favorite thing to do in work? )

| Relational response | 4 | A response that engages the partner to maintain and expand on conversation and imply or demand a response from the partner that may or may not be in the form of questions. The response gets more sophisticated and maintains more personal and relational interaction and shows interest in other person’s needs, likes and ideas (e.g., I do not like baseball as much as softball, I bet you like baseball more, don’t you? You said you like animals. Do you have any pets?) Usually includes some sort of connector sentence before.

*Everything in the photos of the RA, and the previous halves’ questions are considered “on-topic”*
Appendix D

Pragmatics Coding System

<table>
<thead>
<tr>
<th>Score</th>
<th>Scores Definition</th>
</tr>
</thead>
</table>
| **Inappropriate** | 1 | Fails to code-switch. Does not follow Grice’s Maxim of Manner. Asks an inappropriate or overly personal question (e.g. Do you have a boyfriend? Are your parents still together? Can I leave?), or addresses something about the presenter that does not allow for conversation to follow (e.g. Why do you look like a boy? Why is your hair so weird here?). Also uses overly familiar language with or about the interviewee (e.g. pretty, lovely, lucky, annoying).

Statements with no context and misdirect the interviewee. Not a question that the interviewee can respond to.

Can include inappropriate laughter within the context of the conversation (e.g. Interviewee shows picture of their family and the child laughs).

Can also include interruptions of the interviewee.

Can be a laugh or a sigh, if seemingly unprompted, rude, or inappropriate. These are instances where the child does not demonstrate that they are listening to their interviewee by a disconnected response. (e.g., a child laughs when the interviewee explains the task, child laughs at what the RA is wearing in a photo). |
| **Overly Familiar** | 2 | Still fails to fully code switch. Uses overly familiar language with or about the interviewee (RA) (e.g. pretty, lovely, lucky, annoying).

Can include inappropriate laughter (e.g. Interviewee shows picture of their family and the interviewer laughs) Can also include interruptions of the interviewee.

Can include statements such as “I don’t know what else to say”, that attempt some level of politeness, (e.g. What does your brother do that is annoying?) |
Can be a laugh or a sigh. These laughs are ones that are pointed towards the interviewee, and can be making fun of the interviewee (i.e. “you’re wearing tank tops *LAUGHS*”)

- If you are ever unsure what the child is laughing at, it is assumed to be considered inappropriate and receives a 2

Can show an annoyed tone that signals lack of interest in the interviewee or the conversation.

Can also be leading questions that are invasive in nature (i.e. “Do you like your family?”)

- The tones of these questions usually elicit a defensive response from the interviewee
- Can also include the interviewer seeking opinions about an earlier topic that has since been abandoned
- Can indicate a child’s opinion or thought process, and does not have to show attempts to continue the interview (i.e. “I’m running out of ideas”)

**Code Switches**

<table>
<thead>
<tr>
<th>Code Switches</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code switches. Follow’s Grice’s Maxim of Manner. Does not use overly familiar language without prompting (e.g. Tell me about your family? You have a lovely family)</td>
<td></td>
</tr>
</tbody>
</table>

Can be a response that is a filler (ex. mhm, yeah, okay).

Statement or a question that respects the RA and their privacy, “Tell me about your family”

Can include statements such as mentioning that the interviewer does the same activity/ has the same pet/ or has been to the same place as their interviewee, as long as the statement is quick and does not continue into a tangent about the interviewer (e.g. RA: “I’m from New Hampshire”

*Participant: “Me too”*)

These laughs can be laughs that are “saving face” (e.g. laughing at one’s own mistake), or an awkward laugh as the interviewer is thinking of something to say (this is a typical behavior), or as a response to the interviewee’s laughter or joke.

**Sophisticated Code-Switching**

<table>
<thead>
<tr>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A response that follows Grice’s Maxim of Manner thoroughly, while still using sophisticated language that might be more likely to appear with a peer (Boucher 1984) (e.g. Where do you like to vacation? Does vacationing with your family calm you?)</td>
</tr>
</tbody>
</table>
Appendix E
Pragmatics Coding System

On-topic-ness/ Conversation Fluidity (1-4)
From low to high fluidity in conversation topics

*Answering questions
*The overall “topic” is “learning about the RA”. The child’s utterances should be focused on
learning as much as they can from the RA as possible, and less focused on education the RA
about themselves, as they have already done that in the first half of the interview which we do
not code for. This does not always align with what the interviewer wants or believes the topic to
be.
<table>
<thead>
<tr>
<th>Score</th>
<th>Scores Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-Topic Response</td>
<td>1</td>
</tr>
<tr>
<td>Interviewer begins speaking about a new topic without a connection to the previous response or utterance. Shows no acknowledgment of the previous utterances. Additionally, the new topic is ego-centric, and does not allow much space for the interviewee to talk about themselves (e.g. <em>Conversation about summer vacation</em> Is your favorite color blue? Red? Those are my favorite colors). If asked a question by their interviewee, fails to indicate that they are aware. These responses can also be those where the child has begun a tangent. If the child begins an exo-centric topic change, but continues on this topic for more utterances, and does not try to elicit responses from their interviewee, then the child has now been off the interview’s overall topic of “learning about the RA”. Can also lack a topic. A statement where there is no apparent context.</td>
<td></td>
</tr>
<tr>
<td>Disruptive Topic</td>
<td>2</td>
</tr>
<tr>
<td>Interviewer begins speaking about a new topic without a connection to the previous response or utterance. Shows no acknowledgment of the previous utterances, including questions. The interviewer requires and receives prompting from the interviewee to ask a new question and to run the conversation. However, these are less ego-centric responses (e.g. <em>RA showing a picture of their family</em> Child: “Your brother looks funny”). Responding to a question from the interviewee in a rebellious or ego-centric manner.</td>
<td></td>
</tr>
<tr>
<td>• This can happen if the conversation has gone on an “off topic” tangent, and the RA is continuing on the tangent”</td>
<td></td>
</tr>
<tr>
<td>Effectively Changes Topic</td>
<td>4</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---</td>
</tr>
<tr>
<td>Topic change is fluid and unprompted. Includes the behaviors for a 3 but is not prompted by the other conversation participant (e.g. <em>Conversation about summer vacation</em> Do you like going to the beach while on vacation?). These responses are exo-centric (focused on the participant)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Continues on the established topic</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be a response that is a filler (ex. mhm, yeah, okay, fun, cool). The question is less ego-centric (e.g. <em>Conversation about summer vacation</em> Do you like Christmas?)</td>
<td></td>
</tr>
<tr>
<td>The Interviewer has the power to introduce a new topic by asking a new question to get new information from their interviewee. The child introduces a new topic that is not related to the previous utterance with the intent of learning more from the RA (i.e. <em>Conversation about redwoods</em> What is your family like?)</td>
<td></td>
</tr>
<tr>
<td>Can be a laugh if the subjects have been joking These laughs can be laughs that are “saving face” (e.g. laughing at one’s own mistake), or an awkward laugh as the interviewer is thinking of something to say (this is a typical behavior), or as a response to the interviewee’s laughter or joke.</td>
<td></td>
</tr>
<tr>
<td>Can include statements such as mentioning that the interviewer does the same activity/ has the same pet/ or has been to the same place as their interviewee, as long as the statement is quick and does not continue into a tangent about the interviewer (e.g. RA: “I’m from New Hampshire” Participant: “Me too”)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AUTISM IN CONVERSATION</th>
<th>46</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be a laugh or a sigh. These laughs are ones that are pointed towards the interviewee, and can be making fun of the interviewee (i.e. “you’re wearing tank tops <em>LAUGHS</em>”)</td>
<td></td>
</tr>
<tr>
<td>- If you are ever unsure what the child is laughing at, it is assumed to be considered inappropriate and receives a 2</td>
<td></td>
</tr>
</tbody>
</table>

- Effectively Changes Topic
- Continues on the established topic
- 3