“Dotted or horse spotted”: Adventures in Pragmatics

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Autism Spectrum Disorders

- Problems with social communication
- Repetitive behaviour
- Both vary across children and within a child over time.

- Prevalence: 1 in 68 (Centres for Disease Control, 2014)

What is “social communication”?

- And what is pragmatics?

Bob’s “joke”

Example: Bob

- Positive:
  - Words were okay.
  - Sentence structure was fine.
  - Wanted to establish social contact.
  - Jokes as a means to establish contact.
  - Tried to adhere to social conventions.

Bob's communication (cont.)

- What was wrong?
  - Didn't understand the joke.
  - Links to topic.
  - Introduction of topic.
  - How to intersperse topic into flow.

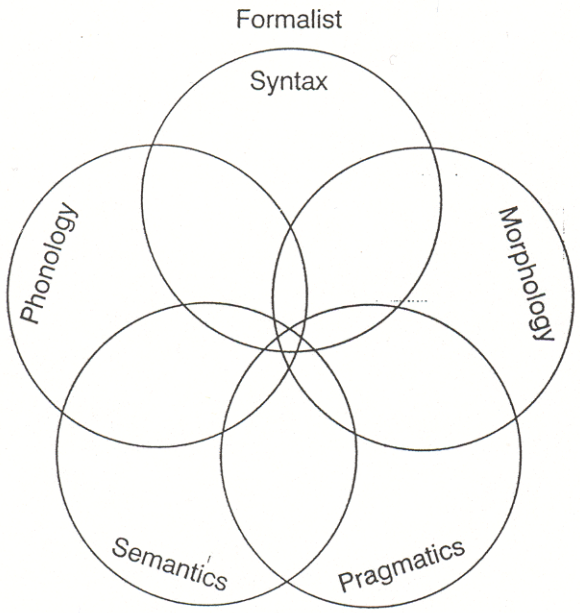
What is pragmatics?

- Is it the same thing as social communication?
  - At least in part, the answer depends upon one's definition of pragmatics.

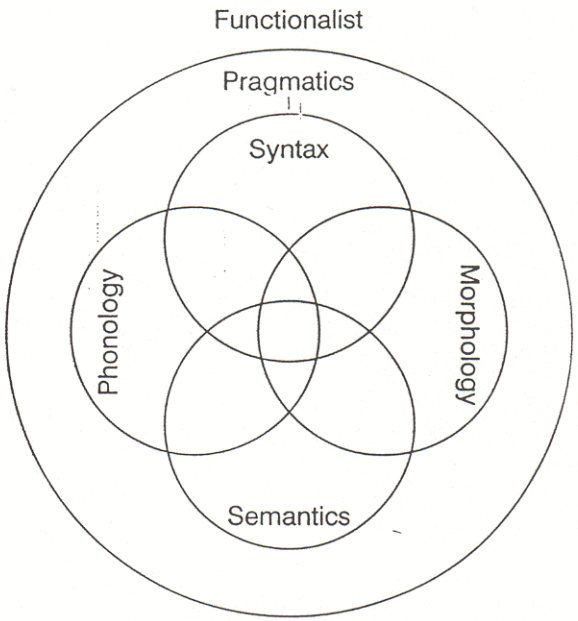
Definitions

- **Broad**: Behaviors that encompass social, emotional, and communicative aspects of social interaction (Adams et al., 2005; Martin & MacDonald, 2003).
- **Narrow**: Concerned with the appropriate use of language across a variety of social contexts (Berko-Gleason, 2005).

Models of pragmatics (Owens, 1999)



Pragmatics is one of five equal and interrelated aspects of language.



Pragmatics is the overall organizing aspect of language.

FIGURE 1.1
Relationship of the aspects of language

Social Communication in ASD

- Social communication deficits persist even in the highest functioning and highest achieving groups (Tager-Flusberg, Paul & Lord, 2005; Kelley et al., 2006)
  - Kelley et al. found semantic and pragmatic problems even in "optimal outcome" children.
- Implication: Easy to miss problems if you're relying on standardized tests.
  - Subtle problems may still be present which will manifest selves when move into higher grades with more complex demands.

Impact of Communicative Impairment

- Need competence to function in school and society (Bryant, 2009).
- Those who are more competent are better liked (Brinton & Fujiki, 1995; Bryant, 2009).
  - Implications for psychological well-being, and subsequent academic and work skills (Rubin, Bukowski, & Parker, 1998).
  - Adolescents and adults relate to each other through conversation, so if these are lacking, youth with ASD are at a disadvantage.
    - Also complicated by possible poor understanding of "friendship" and what it involves (Turner, 2008).

Impact (cont.)

- Avoidance of social situations, generalized anxiety, problems maintaining a job and establishing friends (Landa, 2000; Howlin, 2003).
- Overall, social and communicative aspects more directly related to clinical outcomes than any other aspect of the disorder (Venter, Lord & Schopler, 1992; Howlin, 2003).

Anecdotal descriptors

- "peculiar and out of place in ordinary conversation, irrelevant" (Kanner, 1946)
- "formal, demonstrating a lack of ease in the use of words" (Rutter, 1965)
- "stereotypic, inappropriate" (Bartak, Rutter & Cox, 1975)
- "metaphorical" (Cantwell, Baker, & Rutter, 1978; Kanner, 1946).

What types of problems?

There have been a number of studies that have established that specific pragmatic problems exist in ASD.

- E.g. Initiating conversation, introducing topics, developing topics appropriately, switching topics appropriately, interrupting conversations, introducing unusual topics.

- In almost any area of pragmatics that one could name, significant differences from the typical population have been found.

But, the story isn't entirely straightforward…

- Neologisms and idiosyncratic language (Volden & Lord, 1991)
  - 4 groups (MA: HFA matched to typical adults, autism plus intellectual disability matched to peers with intellectual disability, all matched on CA).
  - Examined language samples from 2 of the items on the ADOS (description of a poster, social conversation)
  - Found very few true neologisms, and no significant group differences on frequency.

We did find…

- … that more of the participants in the groups with ASD used neologisms and idiosyncratic language…so they were infrequent but salient.
- This notion, that a relatively small amount of atypical behavior can have a large impact on listeners, has also been noted by Bishop (1998), and recently by Paul et al., (2009).

Variability

- Symptoms vary within person over time and across cases.
- No single area of pragmatics that is always impaired.
- Even within individual, skills not generally absent entirely, may be demonstrated sporadically.
- In group studies, ASD will perform less well than matched controls on any particular aspect of pragmatics, but often great variability within the ASD group

Elements of pragmatics

- Communicative or Speech Acts
- Conversational Management/Discourse Skills
  - Turn-Taking
  - Topic management
  - Breakdown and Repair
  - Presupposition
  - Style

Communication/Speech Acts

- In free-play or unstructured situations, children with ASD demonstrate less frequent and less varied speech acts than language matched controls.
  - More instrumental speech acts than social ones (Wetherby & Prutting,1984).
    - Suggested different developmental order; sequential vs simultaneous.
  - But, in older children, high proportion of speech acts to get attention and to comment (Stone & Caro-Martinez,1990).

Conversational management/Discourse

- Difficulties in most areas have been reported, but not all have been systematically studied.
- Much of the early research weakened by
  - Small samples that varied widely in terms of CA and MA
  - Failure to use a control group.
  - When controls were included, sometimes matched on CA, sometimes on MA, rarely on LA.
  - Often focussed only on verbal, and ignored nonverbal aspects of communication (e.g. gestures, body language).

Turn-taking

- Children with autism (average CA = 12; average MA = 9) less likely to respond to conversational partner's comments, (Capps et al., 1998).
- Adolescents with ASD (average CA 14.5) rated as unresponsive to partner cues, and with "little reciprocal exchange" (Paul, et al., 2009).

Repairs

- Adults with ASD were less flexible in their responses to requests for clarification (Paul & Cohen, 1984)
- School-aged children responded to stacked series of requests for clarification, and used variety of strategies, adding more info as sequence progressed (Volden, 2004).
  - Evidence in support of the notion that they had repair strategies in their repertoire, but didn't necessarily know when or how to use them. When given increasingly directive prompts were able to repair.
  - Change in strategy also shows ability to remember what didn't work, so some degree of perspective taking.

Topic

- Anecdotal descriptions suggest difficulties in topic

  Irrelevant, peculiar, out of place, metaphorical *(Kanner, 1946)*

  Ambiguous, disorganized *(Loveland et al, 1989)*

Empirical work on topic

- Change topics more frequently (Curcio & Paccia, 1987)
- Difficulty in distinguishing "new" from "old" information (McCaleb & Prizant, 1985)
- Use of cohesive devices (Fine et al., 1994)
- Contingency in preschool children (Tager-Flusberg & Anderson, 1991)
  - Compared children with autism to children with DS, in conversational play samples with mother collected at home.
  - Both ASD and language-matched DS were more contingent than non-contingent
  - But children with ASD were less contingent than children with Down Syndrome, although closer to normal pattern.
  - Unlike both typicals and DS, children with ASD didn't get better at building and maintaining a topic as their language development advanced.

Topic management in school aged

- Same finding with school-age participants (Capps et al., 1998). Participants with ASD were willing to engage and sustain dialogue with examiner, but didn't extend the topic with new information. Relied on developmentally primitive ways of sustaining conversation, e.g. repetition, or routinized, odd scripts,
  - E.g E: Do you like cracker jacks? (3 sec. pause) I like cracker jacks.
    - C: I like cracker jacks, do you like cracker jacks? What's your name?
    - E: Cindy
    - C: I like cracker jacks. What's your name?
- Similar pattern recently found in narratives – ASD tellings of narratives seemed more like lists than stories. Indicative of superficial understanding (Diehl, et al., 2006)

Irrelevant/Inappropriate

- Frequent irrelevant/inappropriate remarks (Loveland & Tunali, 1991, Volden, Holdgrafer & Mulcahy, 1993; Capps et al., 1998).
- In a task where participants were asked to describe a geometric shape to a listener:
  - *Did you know that a zebra is something like a horse?*
  - *It's dotted or horse spotted.*
  - *The one of the left has dots, the one on the right has been cut.*
- In the midst of a conversation about after-school activities,
  - *Sabre-tooth tigers can't fly.*

Examples

- In a task where participants were asked to describe a geometric shape to a listener:
  - *Did you know that a zebra is something like a horse?*
  - *It's dotted or horse spotted.*
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Inappropriate Utterances

- To investigate directly, looked for utterances judged to be inappropriate, classified as to features led to judgments of inappropriacy (Bishop & Adams, 1989)
- Mean proportion of inappropriate utterances in ASD (.19) significantly different from mean proportion in controls (.02); $t(16) = 2.8$, $p < .02$

Specific sub-types

- Too little information
  - *A: Where do you get the skytrain?*
  - *C: At the end.*
  - *A: At the end?*
  - *C: At the end of the track.*
- Too much information
  - Listing 10-15 specific items in a narrative description of "what to do when you go to a grocery store"

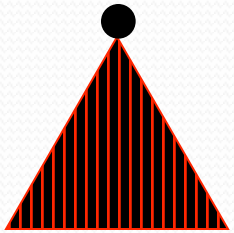
Unusual/socially inappropriate content or style

- *A: You get to the end of the skytrain and then what?*
- *C: Well, seabus is the way to get to skytrain.*
- *OR*
- *A: So, you watch the movie. Then what?*
- *C: A cabbage keeps rolling up in my head.*

Topic in adolescence and adults

- "Goodness of Fit": Detailed conversational analysis analyzed the "goodness of fit" between adjacent utterances in conversation by seeing how well they "meshed". Participants with Asperger's syndrome much less well-meshed than controls (Adams et al., 2002).
- Paul et al., (2009), also found that items about providing irrelevant detail, inappropriate topic shifts, and topic pre-occupation or perseveration differentiated ASD from typical.

How would you describe this?



T’s description

- “I would describe it as a unilateral triangle with a black dot running straight along the point, from the apex to the centre of the base, lined with vertical stripes.”

Conversational Style?

- Significant proportion of the "inappropriate utterances" were instances of difficulty with conversational style. Not frequent, but salient.
- Language register:
  - Different language registers reflect who speaker is addressing, where he/she is, what the social event is, what topics are appropriate and the social relationships between the speakers (Ervin-Tripp, 1978)

Register study (Volden, et al., 2007)

- Asked participants to explain “how to go to a restaurant” to a series of listeners representing different levels of language competence (adult examiner, peer, baby, foreign language speaker).
- Then, administered prompts to see whether explanations could be improved and to determine possible sources of anticipated difficulty in spontaneous adjustment.

Results

- Speakers with ASD did demonstrate some sensitivity to needs of less competent listeners by simplifying script narrative (fewer acts, fewer utterances). Argues for some degree of perspective-taking skill.
- They were, however, less adept in that adjustment than appropriately matched controls (fewer prototypical acts, using significantly more utterances than other groups) .
- When prompted, performance improved, suggesting that skills may be present but not spontaneously employed, or that skills additional to perspective taking are needed for successful pragmatic performance.

  - Possible deficits in executive functioning, or that ASD is a disorder of complex information processing (Minshew & Goldstein, 1998)
  - Clinically, skills can sometimes be elicited by drawing attention to relevant cognitive strategies that already exist in their repertoire rather than teaching additional skills.

Adults (Mitchell, 2015)

- 20 adults with ASD matched to 20 typical on CA, NVMA, and educational level.
- Completed battery of formal tests plus analysis of language sample.
- Formal test of pragmatic skills (CASL) showed group with ASD significantly below controls, but mean still within normal limits.
- Communication Checklist – Adults (CC-A; Whitehouse & Bishop, 2009) informant measure, identified problems.
- Also, CASL scores significantly below CELF Core Lang.

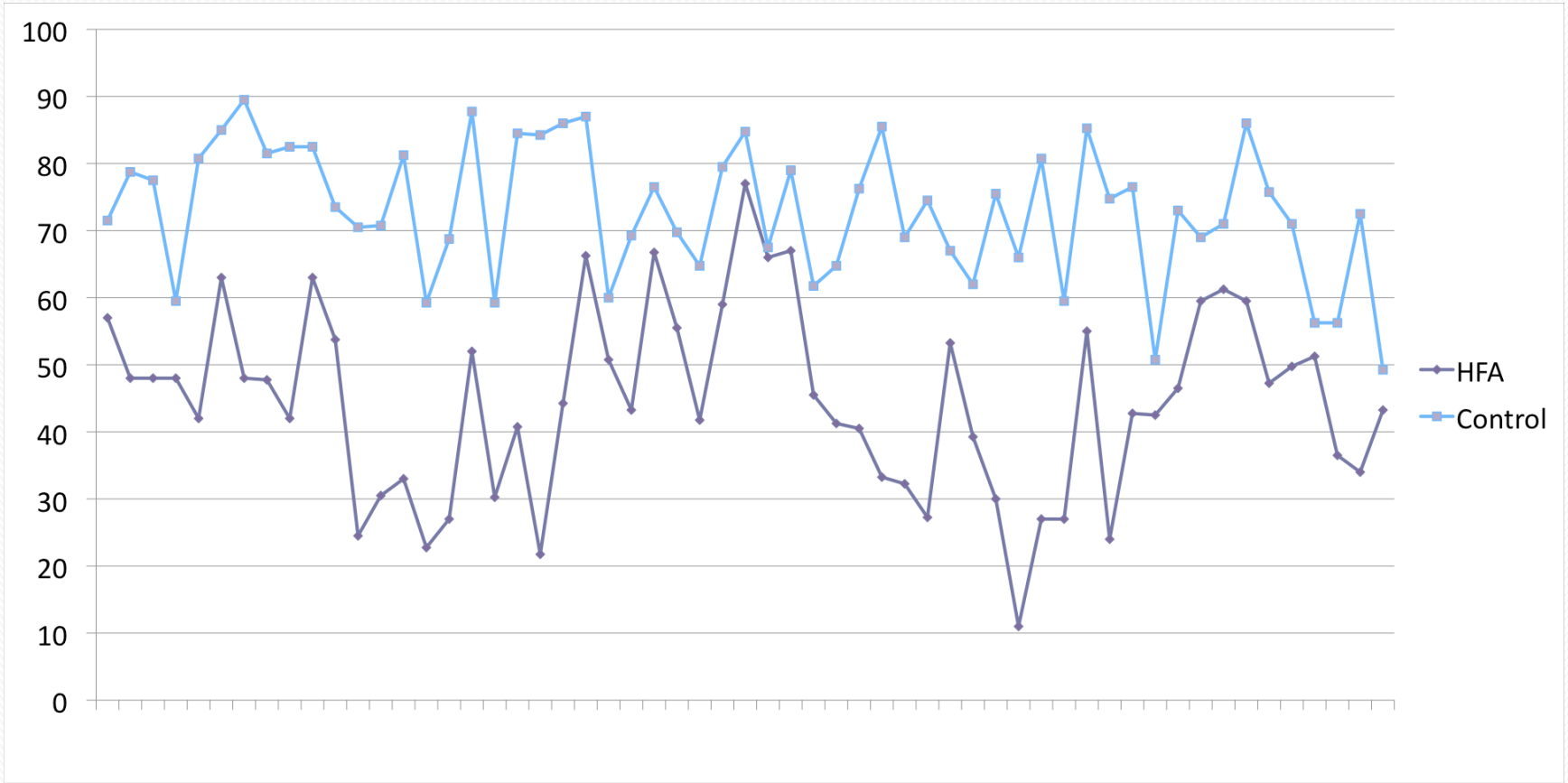
Examples - Language Sample

- Irrelevant: (In reponse to “What’s your work experience?”). *I worked at the Mayfair Golf and Country Club. In the locker room. Locker room attendant was my position. I shined shoes for a living. And it was pretty good.* ***The thing about the Mayfair is that they have really really good food.***
- Unannounced topic shift: (in response to “What is your greatest strength?”). *My singing, I think definitely. My teacher was ecstatic about my skill. I already had raw talent and thanks to her I refined it.* ***And some of my favourite music is Pink Floyd. I’m a sucker for classic rock.***

Would everyone agree?

- Mitchell did follow-up study where she evaluated listener reactions to audio-taped samples.
- 59 graduate students rated the "quality" of language samples. Participants were blind to diagnosis and samples randomized.
- "Quality" defined as (1) amount of information communicated (2) how easy it was to understand the speaker (3) how easy it seemed for the interviewee to participate in the situation/interaction.

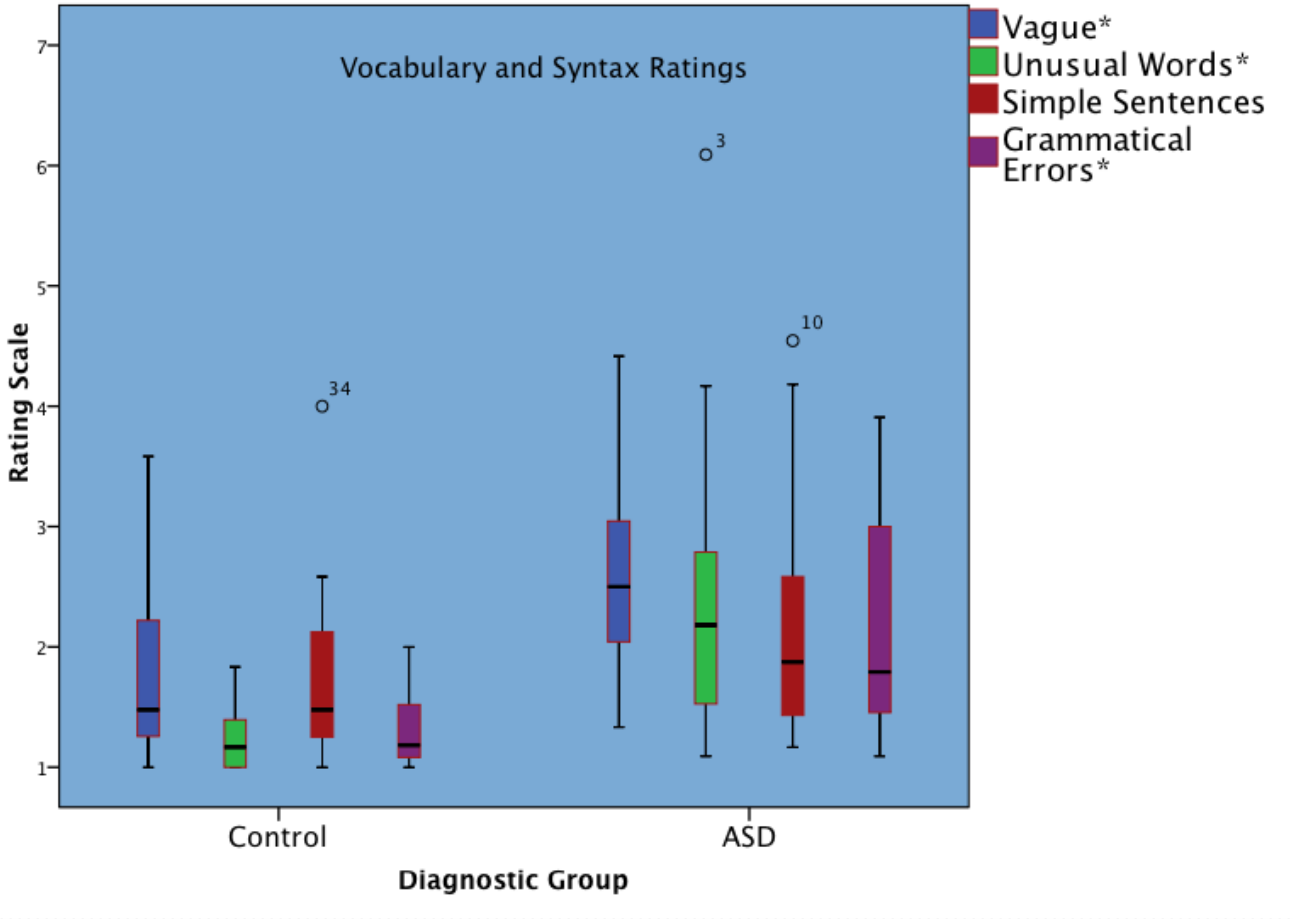
Average ratings of quality by listeners

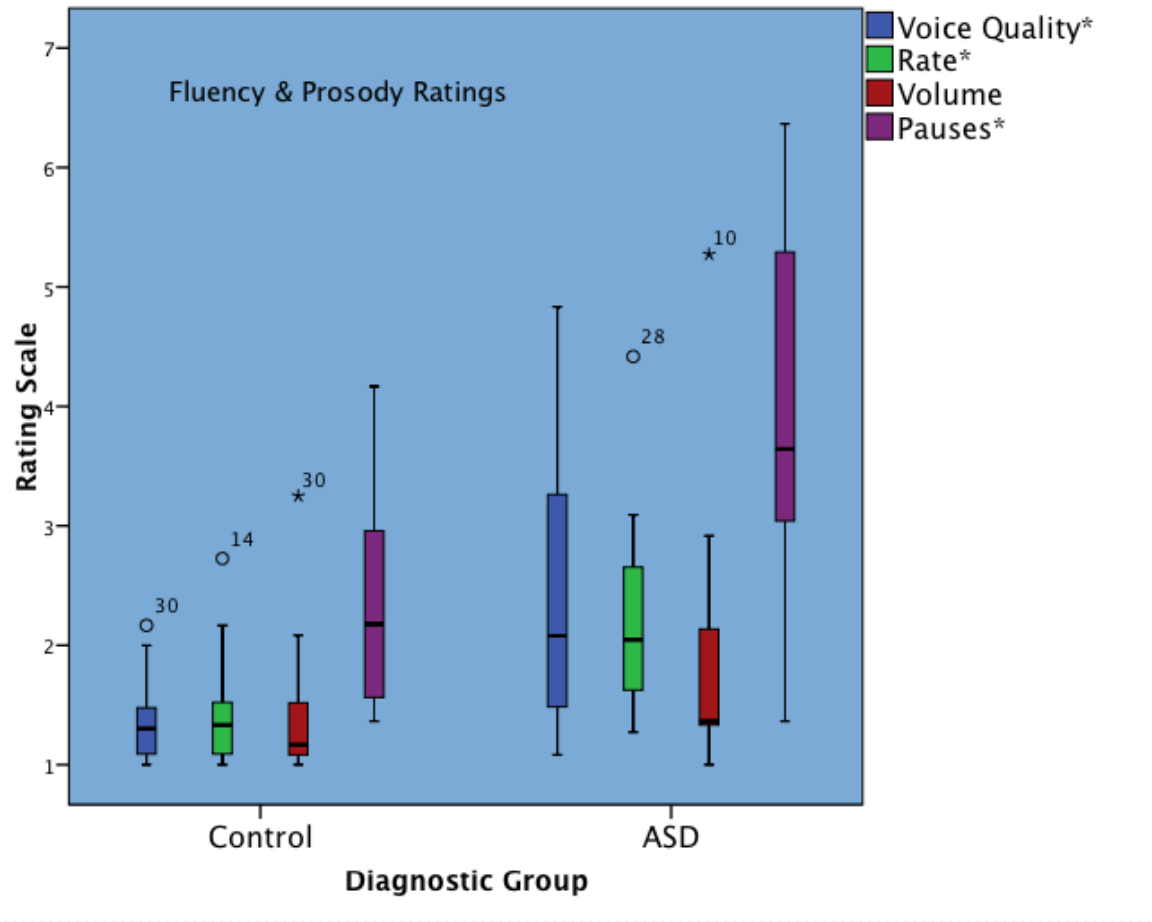


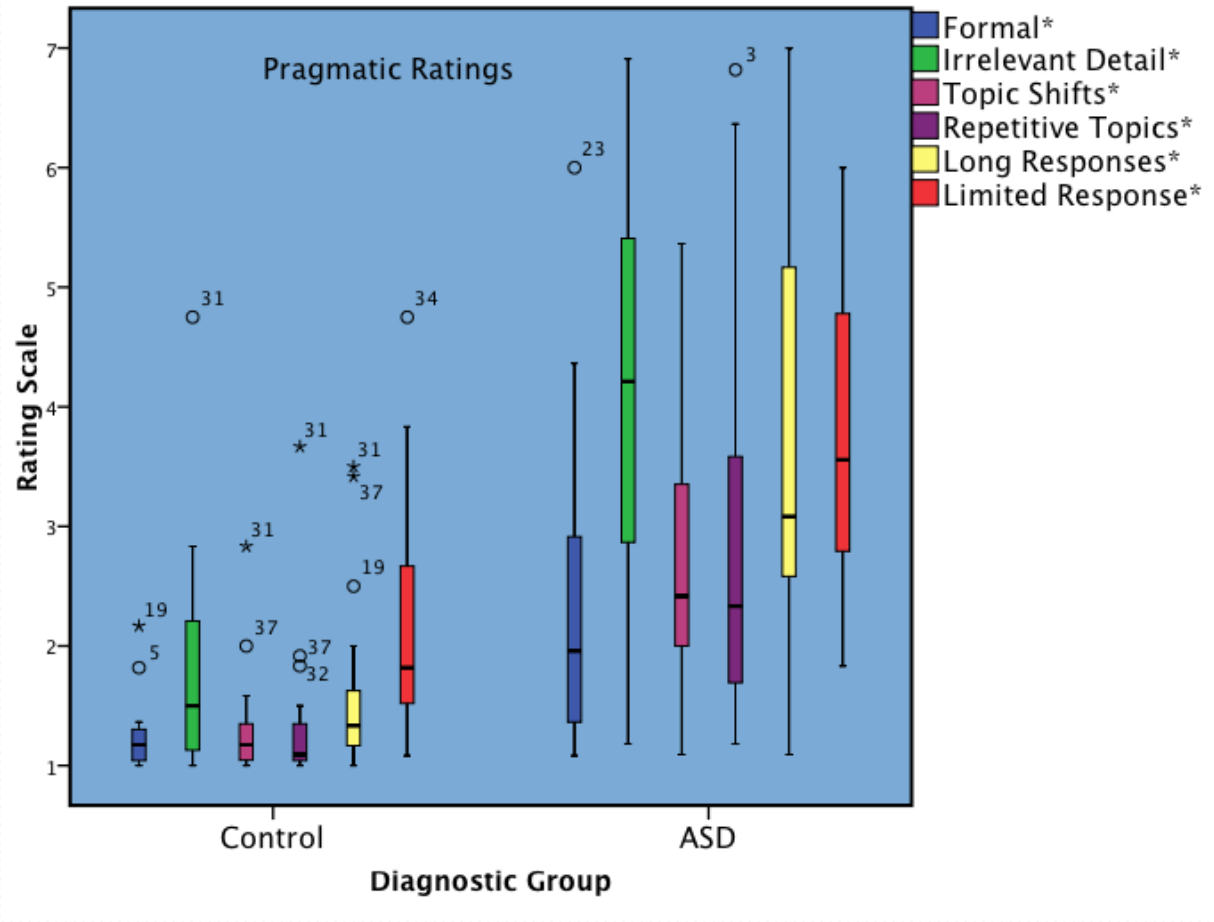
Also, after each sample…

- Listeners asked to rate, on a 7 point scale, what aspects of communication influenced their ratings of quality.
- Results: Each domain's average influence (vocab and syntax, fluency and prosody, pragmatics) was significantly different between groups, as was each of the asterisked individual aspects on the following graphs.

Results


Vocabulary and Syntax Ratings
Vague*
Unusual Words*
Simple Sentences
Grammatical Errors*
Rating Scale
7
6
5
4
3
2
1
3
10
34
Control
ASD
Diagnostic Group


Fluency & Prosody Ratings
Voice Quality*
Rate*
Volume
Pauses*
Rating Scale
7
6
5
4
3
2
1
30
14
30
28
10
Control
ASD
Diagnostic Group


Pragmatic Ratings
Rating Scale
Diagnostic Group
Control
ASD
Formal*
Irrelevant Detail*
Topic Shifts*
Repetitive Topics*
Long Responses*
Limited Response*

Finally…

- Listeners asked to decide whether or not they would offer a second interview to the person, if they were an employer.
  - 30% of the HFA group vs 75% of the controls would be offered a second interview or a job. (Fisher's exact probability <.005)