

THE DOUBLE INTERVIEW TASK: ASSESSING THE SOCIAL  
COMMUNICATION OF CHILDREN WITH ASPERGER SYNDROME

by

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## ABSTRACT

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This was a study designed to determine if there was a difference in performance on a social communication assessment procedure, the Double Interview Task, (Winner, 2002) in children with Asperger Syndrome and children of the same age who were developing typically. There were 20 participants in this study, 10 with Asperger Syndrome and 10 developing typically. A difference in performance between groups was found. Children with Asperger Syndrome used more utterances but asked fewer questions than participants developing typically. Overall, children with Asperger Syndrome made more errors in each of the error categories including: having difficulty formulating questions, asking shallow questions, diverting the topic back to themselves or their experiences, repeating a question that the researcher asked them, making revisions including false-starts and self-interruptions, and needing to be redirected back to the task of asking questions. Children with Asperger Syndrome were less effective at the Double Interview Task. This overall difficulty can be attributed to a deficit in social communication, said to be the core deficit in

individuals with Asperger Syndrome. A difference was shown in perspective taking ability of children with Asperger Syndrome as compared to children developing typically. The Double Interview Task evaluates the students' ability to shift perspective, to organize thoughts into language that moves in a purposeful direction toward someone else's area of interest, and to formulate questions and follow up with more specific questions to explore another persons' interests (Winner, 2002). The Double Interview Task can be used to establish a baseline for these skills, to monitor progress during intervention, and as a post intervention measure.

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## CHAPTER I

### Introduction

The term Pervasive Developmental Disorders (PDD) was introduced in order to provide a formal diagnosis for a wide spectrum of neurodevelopmental disorders that are characterized by marked social impairment, communication difficulties, play and imagination deficits, and a range of repetitive behaviors or interests (Klin & Volkmar, 2002). Pervasive Development Disorders include: Autistic Disorder, Pervasive Developmental Disorders – Not Otherwise Specified (PDD-NOS), Rett’s Disorder, Childhood Disintegrative Disorder, and Asperger’s Disorder (DSM-IV-PR; American Psychiatric Association, 2000).

Asperger Syndrome was first described by Austrian pediatrician, Hans Asperger (1944), who noticed a similar pattern of behavior in several young boys with normal intelligence and language development but who displayed distinct behavior patterns and had difficulty with reciprocal social interaction. He described these children as having difficulty integrating into groups. Despite average to above average intelligence levels, these children showed a lack of nonverbal communication involving gestures and affective tone of voice, a tendency to engage in long-winded, one-sided formalistic speech, and obsessive interests that dominated their conversation. It was also noted that these children developed complex expressive language.

Today, the social impairment and communication difficulties of individuals with Asperger syndrome are well recognized (American Psychiatric Association,

2000; World Health Organization, 1990; Klin & Volkmar, 2003; Gillberg & Gillberg, 1989). Although Asperger Syndrome was first described in 1944, it wasn't until 1994 that it was included in the Diagnostic and Statistical Manual of Mental Disorders- 4<sup>th</sup> Edition (American Psychiatric Association, 1994). Two areas are associated with Asperger Syndrome (a) qualitative impairment in social interactions and (b) restricted, repetitive, and stereotyped patterns of behavior, interests, or activities (DSM-IV-TR; American Psychiatric Association, 2000).

Asperger Syndrome is distinguished from autism by the presence of typical language development and normal to high cognitive ability. The diagnostic criteria for Asperger Disorder (299.80) according to the DSM-IV-TR (American Psychiatric Association, 2000) are presented below:

- A. Qualitative impairment in social interaction, as manifested by at least two of the following:
  - 1. marked impairments in the use of multiple nonverbal behaviors such as eye-to- eye gaze, facial expression, body postures, and gestures to regulate social interaction
  - 2. failure to develop peer relationships appropriate to developmental level
  - 3. lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g. by a lack of showing, bringing, or pointing out objects of interest to other people)
  - 4. lack of social or emotional reciprocity

B. Restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:

1. encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
2. apparently inflexible adherence to specific, nonfunctional routines or rituals
3. stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements)
4. persistent preoccupation with parts of objects

C. The disturbance causes clinically significant impairment in social, occupational, or other important areas of functioning

D. There is no clinically significant general delay in language (e.g., single words used by age 2 years, communicative phrases used by age 3 years)

E. There is no clinically significant delay in cognitive development or in the development of age-appropriate self-help skills, adaptive behavior (other than social interaction), and curiosity about the environment in childhood

F. Criteria are not met for another specific Pervasive Developmental Disorder or Schizophrenia (p. 84).

Children who meet the criteria for Asperger Syndrome are the focus of this study.

## *Social Cognition*

Social cognition can be defined as “our innate ability to think through and apply information to succeed in situations that require social knowledge” (Winner, 2003). More broadly, social cognition is thinking about people. It involves our attempts to make sense of human action such as how people think, perceive, feel and react. Developing an awareness and understanding of what people think, feel and do is important for children’s effective functioning in the social world (Hala, 1997). Social cognition is the process that underlies our understanding of the social world (Feldman, 2003).

The development of social cognition begins during infancy. From very early on, infants display different interaction patterns with humans than with objects. Infants display many different behaviors which suggest that they focus on interactions with people. For example, infants spend more time listening to human voices than to other sounds (Colombo and Bundy, 1981). They prefer to look at human stimuli over inanimate stimuli (Walton, Bower and Bower, 1992). They look longer at faces that are accompanied by voices (Haith, Bergman & Moore, 1977). By about seven months of age, babies can begin to recognize emotional expressions (Walker-Andrews & Grolnick, 1983).

*Social referencing.* An important transition in social cognitive development occurs at around nine months of age when infants start to tune into the attention of the people around them (Franco, 1997). The emergence of social referencing suggests that infants not only detect and discriminate others’ expressions, but also form a

connection between those expressions and other events in the environment (Franco, 1997). The process of social referencing occurs when infants look for a person's reaction to objects and social events (Bruner, 1981). For example, a baby looks at others to find out if an object is safe, and responds differently to a smile than to an expression that shows alarm (Barbieri, 1999). By watching adult's facial expressions and listening to their tone of voice, babies as young as 10 months old can use emotional information to make decisions (Walden and Ogan, 1988). Social referencing may be considered the beginning of the ability to take someone else's emotional point of view about a common referent.

*Theory of mind.* Over time, young children develop theory of mind, the ability to understand that others have intentions, thoughts, desires, and feelings that differ from their own (Baron-Cohen, Leslie, & Frith, 1985). When children understand false beliefs is said to be a gauge for determining when children first acquire theory of mind. According to Hala and Carpendale, (1997), children need to understand that people will act according to their beliefs about the world, even when these beliefs are wrong in order to possess an adequate theory of mind. Two year-olds are said to lack any understanding of beliefs (Wellman, 1991). Sometime around three years of age, an understanding of beliefs emerges. Children understand that people will behave in accordance with their desires as well as in relation to their beliefs. For example, children with an emerging understanding of beliefs will predict, if a boy wants his puppy and he thinks the puppy is in the garage, then he will look in the garage first. Around four years of age, children are said to go through a

conceptual revolution in their thinking and full belief-desire psychology is said to emerge (Hala & Carpendale, 1997). According to Wellman and Banerjee (1991), in order for children to develop belief-desire reasoning that supports their intentional actions, they must first understand the nature and causes of emotions.

*Perspective taking.* Perspective taking is the ability to assume another person's perspective and understand his or her thoughts and feelings (Santrock, 1999). Underwood and Moore (1982) found that perspective taking was positively related to prosocial behavior. Children's perspective taking is said to increase their self-understanding as well as improve the quality of their friendships. A developmental theory of perspective taking is outlined by Selman (1980). According to Selman (1980), these stages begin with the egocentric viewpoint in early childhood and end with in-depth perspective taking in adolescence. Children three to six years of age hold an "egocentric viewpoint". In this stage, the child has a sense of differentiation between himself and others, but does not distinguish between the social perspective (thoughts and feelings) of others and himself. Children six to eight years of age are in the "social-informational perspective taking" stage. The child is aware that others have a social perspective based on their own reasoning, and this perspective may or may not be similar to the child's. However, the child has a tendency to focus on one perspective instead of coordinating viewpoints. Children eight to ten years of age are said to be in the "self-reflective perspective taking" stage. The child understands that each individual is aware of the other's perspective and that this awareness influences themselves and other's view of each other. He can judge

other's intentions, purposes, and actions by putting himself in another's place. By ten to twelve years of age, the adolescent is in the "mutual perspective taking" stage and can step outside the two-person dyad and view the interaction from a third person perspective. Between twelve and fifteen, the adolescent is said to be in the "social and conventional system perspective taking" stage. In this final stage, the adolescent realizes mutual perspective doesn't always lead to complete understanding. Social conventions are seen as necessary and understood by all members of the group.

### *Social Cognition and Asperger Syndrome*

The diagnosis of Asperger Syndrome implies the existence of a social and communicative deficit (Klin & Volkmar, 2003; Paul, 2003; Silliman et al. 2003). A limited ability to learn and/or apply socially relevant information is considered by some to be a social cognitive learning disability (Winner, 2002). Three models that help to describe deficits in social cognition for these children include: Theory of Mind (Baron-Cohen, Leslie & Frith, 1985), Central Coherence Theory (Frith, 1989), and Executive Dysfunction Theory (EcEvoy, Rogers, and Pennington, 1993),

*Theory of mind.* The Theory of Mind hypothesis is said to be the most influential psychological hypothesis of autism (Klin, 2000). Baron-Cohen (1995) first referred to this inability to see into the minds of others as mindblindness, a state in which children with ASD are "blind to their own past thoughts and to other people's possibly different thoughts" (p.82). This includes how beliefs can predict emotions. This developmental delay in social cognition impacts children's abilities to make more complex inferences about the cognitive and social states of others

(Sillman, Diehl, Bahr, Hnath-Chisolm, Zenko & Friedman, 2003). These children have difficulty understanding that behavior is typically regulated by mental states, such as beliefs, thoughts and expectations, desires and intentions and not by factual reality (Baron-Cohen, Tager-Flusberg, & Cohen, 1993). Although it has been shown that individuals with autism exhibit varying degrees of theory of mind capacities, (Sigman, Yirmiya & Capps, 1995; Yirmiya, Erel, Shaked, Solomonica-Levi, 1998), it has been said that disruptions in social perspective taking is a common feature across autism spectrum disorders (Silliman et. al, 2003).

A deficit in theory of mind may manifest in daily life in a number of different challenges. For example, predicting events such as what is going to happen next may be difficult. An individual with a theory of mind deficit may have a hard time reading intentions, for example, they may not be able to tell if they are being teased or supported. They may have difficulty explaining their own behavior. Taking perspective or reference, such as distinguishing between opinion or fact may be a challenge. These individuals also have problems reading and then reacting to other's interests. (Myles, 2003).

All together, these difficulties would make it very challenging for an individual with a theory of mind deficit to have an overall understanding of social interactions. "Impairments in theory of mind, while not exclusive to ASD, are considered a major feature of the significant sociocognitive and communicative difficulties confronting individuals with ASD" (Silliman et. al, 2003, p.240).

According to Winner (2002), theory of mind/perspective taking deficits exist on a

spectrum of function as well as autism spectrum disorders. She believes that the spectrum of autism does not correlate exactly with the perspective taking spectrum. In some cases, a student with Asperger Syndrome can have more severe deficits in perspective taking compared to a student diagnosed with high functioning autism. Therefore, it is important to assess how an individual functions on the perspective taking spectrum independent of their medical diagnosis.

*Central coherence theory.* Central Coherence Theory (Frith, 1989) generally states that individuals on the autism spectrum have a difficult time understanding the larger picture. Instead, they tend to think in parts, not fully relating their information back to a larger pattern of behavior and thought. They are unable to quickly “get the gist” of what’s happening around them. According to Winner (2002), central coherence theory shows individuals with Asperger Syndrome have a conceptual learning disability. These individuals have difficulty with problem solving because they may only have one way of viewing a problem with only one option. Difficulty with problem solving may also be due to the fact that these individuals see facts instead of a whole, and have difficulty with cause and effect. They may also have difficulty generalizing across situations without practice, and a lack of flexibility in thinking (Myles, 2003). Individuals with Asperger Syndrome may be able to formally describe other people’s emotions, expected intentions, and social conventions, but they are then unable to act on this knowledge spontaneously. Their lack of instinct and lack of spontaneous adaptation are coupled with definite reliance on formalistic rules of behavior and rigid social conventions (Klin & Volkmar, 2002).

These difficulties prevent them from engaging in the natural reciprocity of conversation. They may use logic and reasoning to process the social information that others are able to arrive at intuitively. Results of a deficit in central coherence may result in problems from misunderstood directions to failed interactions with peers (Winner, 2002).

*Executive dysfunction theory.* Some features of autism spectrum disorders suggest that these individuals have an executive function deficit (McEvoy, Rogers, and Pennington, 1993). Executive function is defined as “the ability to maintain an appropriate problem-solving set for attainment of a future goal; it includes behaviors such as planning, impulse control, inhibition of prepotent but irrelevant responses, set maintenance, organized search, and flexibility of thought” (Ozonoff, Pennington, & Rogers, 1991, p. 1083). Individuals with autism spectrum disorders often appear as rigid and inflexible. Often times they are perseverative, and focus on one narrow interest or repetitively engage in one stereotyped behavior. They may also appear impulsive, as if they are unable to delay or inhibit their responses (Ozonoff, Pennington & Rogers, 1991). Almost all people with social cognitive deficits have some difficulty in their ability to create organizational structures that allow for flexibility and prioritizing. These individuals need structure but have a hard time creating their own healthy structures (Winner, 2002). Myles (2003) reports that these individuals also have difficulty imitating others and starting and stopping an activity. For example, a student with ASD may not only have difficulty starting an academic assignment, but also stopping an assignment prior to the individual’s

perceived completion of the assignment. An executive function deficit may be a cause of unsuccessful social interactions as well as academic difficulties.

A weakness in the development of theory of mind may contribute to dysfunction in central coherence and executive functioning. According to Winner (2002), there appears to be a positive relationship between an individual's theory of mind deficit and their corresponding level of deficit in central coherence and executive functioning. These theories in combination may help to paint a clearer picture of the overall difficulties associated with social cognitive deficits.

### *Social Cognition and Communication*

Diagnostic criteria suggest that there is no clinically significant general delay in language development in children with Asperger Syndrome (American Psychiatric Association, 2000). Structural aspects of language such as grammar, vocabulary and articulation are usually typical or even precocious, but the social use of language, such as conversational skills, is almost always impaired (Myles, 2003).

Although children with Asperger Syndrome may have typical language skills, all communication, being an exchange of information between a speaker and a listener, is social in nature. Pragmatics is the area of language function that embraces the use of language in social contexts, such as knowing what to say, how to say it, when to say it, and how to “be” with other people (Bowen, 2001). Individuals with autism spectrum disorder exhibit unsuccessful pragmatic communication (Tager-Flusberg, 1993; Tager-Flusberg and Anderson, 1991).

Theory of mind, (the ability to infer the mental states of others) allows children to anticipate, comprehend and predict the social behaviors of others. This understanding is critical to social-communicative interactions. During social interactions the child interprets meaning and intent from the verbal and nonverbal behaviors of the communication partner. With this social knowledge, the child can then monitor and adjust his/her own language and social behavior during an interaction (Quill, 2002; Baron-Cohen, Tager-Flusberg & Cohen, 1993; Sillman et al., 2003). “Successful communication depends on how adequately conversational partners are able to infer the motivations underlying each other’s mental states” (Sillman et. al p. 237). Without a developed theory of mind and perspective taking abilities, social communication is bound to be unsuccessful. Perspective taking is said to be the core of verbal communication (Sillman, et al., 2003).

This deficit in social communication is evident from early social communicative interactions. Around the age that theory of mind is emerging, preschool age children who are developing typically engage in a range of social interaction skills that are facilitated by their language development. Children as young as three years of age use language to negotiate play roles and activities (Garvey, 1975). By this age, children use language for a multitude of purposes in play, such as to narrate action and to plan future events in the context of play (Patterson and Westby, 1994). Even though children with Asperger Syndrome don’t show significant delays in the acquisition of language, because of their core deficits in social cognition and communication, they are less able than their peers to use these

social forms of language in the context of cooperative play (Schuler and Wolfberg, 2002). Wolfberg (1999) found that without support, children with autism spectrum disorders tended to engage in repetitive solitary routines around their perseverative interest and avoided social play, or they approached their peers with obscure, monologues that were unlikely to be reciprocated. Children who have competent perspective taking skills are better at understanding the needs of their peers so they are likely to communicate more effectively with them (Hudson, Forman, & Brion-Meisels, 1982).

In school-age children, to some extent, good verbal language abilities may mask the severity of the child's social communication disorder (DSM-IV-TR; American Psychiatric Association, 2000). The social communicative disability of individuals with Asperger Syndrome is said to become more evident over time. By adolescence, some of these individuals may learn to use areas of strength such as rote verbal abilities to compensate for their area of weakness (DSM-IV-TR; American Psychiatric Association, 2000). According to the American Psychiatric Association (2000), individuals with Asperger Syndrome experience victimization by others. This in combination with feelings of social isolation and an increased self-awareness may contribute to the development of depression and anxiety in adolescence and young adulthood. The social and communicative deficit associated with individuals with Asperger Syndrome has been referred to as "the most handicapping conditions associated with Asperger syndrome" (Paul, 2003, p. 87). For these reasons, it is critical that the social and communicative deficit associated with Asperger Syndrome

is identified and accurately assessed so that these individuals may receive the appropriate services and supports.

*Assessment of social cognition*

The core deficits associated with Asperger Syndrome are in the social or pragmatic use of language. Therefore, it falls under a speech-language pathologist's scope of practice to assess and provide services or support to individuals with Asperger Syndrome experiencing these difficulties. The challenge then becomes how to best assess social cognition.

*Standardized tests.* Some standardized tests available in the field of speech-language-pathology that assess students' pragmatic skills include the Test of Pragmatic Language (TOPL) (Terasaki & Gunn, 1992) and the Social Pragmatic Subtest of the Comprehensive Assessment of Spoken Language (CASL) (Carrow-Woolfolk, 1999). In the TOPL (Terasaki & Gunn, 1992), students are presented with social scenarios and they are required to respond with an example of how they would handle the situation. The CASL (Carrow-Woolfolk, 1999) includes a range of subtests that are designed to explore receptive, expressive and receptive language. A subtest of pragmatic judgment can be used with children of all ages.

Standardized tests are limited in their practical application and may not paint an accurate picture of a student's true social pragmatic difficulties in ongoing communicative interactions (Winner, 2002). Individuals with Asperger Syndrome have a disability that is highlighted in conversation. Conversations occur with no advanced notice, yet they require sophisticated planning, timing, and self-regulation

in their execution and therefore reveal impairments that are not evident on standardized tests (Turkstra, Ciccio, & Seaton, 2003).

Factors that promote theory of mind task performance may also promote good performance on other standardized tests such as the CASL (Carrow-Woolfolk, 1999) and the TOPL (Terasaki & Gunn, 1992). A number of studies have shown that theory of mind task performance is correlated with level of verbal skills (Bowler, 1992; Eisenmajer & Prior, 1991; Fombonne, Siddons, Achard & Frith, 1994; Happe, 1995; Yirmiya and Shulman, 1996). Students with high functioning autism and Asperger syndrome have been shown to pass relatively high- level theory of mind tasks without demonstrating appropriate levels of social adaptation in natural settings (Klin, 2000; Silliman et. al, 2003). Children with Asperger Syndrome typically have good verbal skills, which could contribute to a better performance on formalized tests than in daily communicative situations.

Individuals with Asperger Syndrome have difficulty generalizing, particularly in novel social situations, which makes up most spontaneous social situations in real life. Central Coherence Theory (Frith, 1989) accounts for this deficit in the ability to understand the larger picture. Typically in formalized tests, the problem to be solved is clearly defined by the question posed, or tests items are presented in isolation, thus not identifying a difficulty with generalization. Social situations rarely appear this clear cut in real life. Most responses on theory of mind tasks are classified as either a theory of mind response or a non-theory of mind response. The dichotomous nature of theory of mind tasks doesn't appear adequate for describing the "flexible and

abstract aspects of social-cognition,” (Winner, 2000, p. 6). These children have a range of difficulties with social communication, which is most evident in every day interactions. A continuum of social dysfunction in individuals with autism spectrum disorders is often observed in naturalistic settings (Wing, 2000).

Overall, performance on formalized tests appears to be influenced by language abilities and these tests fail to capture the complex difficulties of children with Asperger Syndrome. Children with social cognitive learning difficulties, such as those with Asperger Syndrome may score within normal limits on a formal speech and language assessment, but be unable to socially interact with their peers. Often times the assumption is made that if a student has skills to understand and formulate language, the pragmatic aspect of language is in place. Children with social-cognitive deficits can demonstrate an excellent command of language and more rote or rule based learning, but at the same time have significant problems functioning in the world around them (Winner, 2000).

*Communication assessment.* Pragmatic assessment needs to take place within the framework of a whole discourse and not within the framework of individual units, which have been isolated from context (Neville, 1990). According to Klin and Volkmar (2003), a communication assessment for an individual with autism spectrum disorder should examine nonverbal forms of communication such as gaze and gestures, nonliteral language, suprasegmental aspects of speech (patterns of inflection, stress, volume), pragmatics such as turn taking, and content, coherence, and contingency of conversation. Often the child’s disability is much more apparent

during periods in which the child is not given any instruction and has no imposed expectation as to how to behave (Klin & Volkmar, 2003). Based on the fact that the social communication of individuals with Asperger Syndrome is highlighted during natural conversation, an assessment that accurately illustrates these deficits should be based on a conversational model.

In order to understand what makes an individual a successful or unsuccessful communicator, obtaining normative data based on predictive statistics is not enough. This data gives little information about the strengths and areas of need of the individual as a communicator. Instead, the focus should be on actual behaviors and the functional aspects of communication in order to determine whether difficulties exist and why those difficulties exist (Tetnowski & Franklin, 2003). A standardized tool that evaluates social-pragmatic skills while engaged in conversation is not available in the field of speech-language pathology.

Though there are no standardized measures of social communication, Damico (1991) developed the Clinical Discourse Analysis, which takes a functional rather than a structural perspective of language. The Clinical Discourse Analysis is based on Grice's (1975) cooperative principle, which states that conversation is accomplished by cooperation between the people communicating together. In this assessment, a conversational sample is taken, transcribed and then analyzed for errors in the categories of quantity, quality, relation and manner of communication. The tool has been used to identify individuals who have difficulties with conversational language skills.

*The Double Interview Task.* The Double Interview Task is a promising tool developed by Winner (2002) that may be used to assess social communication in children with social pragmatic deficits within a natural discourse setting. The Double Interview Task has the functional orientation of the Clinical Discourse Analysis with a focus on the areas of social communication usually deficient in individuals with Asperger Syndrome. Winner describes the tool as an informal assessment procedure that is said to increase insight into students with social communication difficulties main problem: “their inability to assess how to talk to the other person so that the other person wants to maintain the relationship.” The Double Interview Task has the potential to be used to create appropriate intervention for a child based on their individual social communication needs, not solely based on the diagnostic label. Winner (2002), reports anecdotally, that there appears to be a significant difference in the performance of students with social pragmatic deficits on the Double Interview Task, and their typically developing peers.

The Double Interview Task begins with the investigator asking the student questions about his/her hobbies. After the clinician completes the interview, the student is asked to interview the clinician. Prior to asking the student to begin the interview, he/she is asked to explain three personal pictures on the table. Errors in identifying the people in the pictures and describing the pictures are placed into four general categories:

1. Limited ability to shift perspective
2. Difficulty reading others’ faces

3. Limited accounting for contextual cues
4. Limited ability to make inferences

The student is then given the opportunity to interview the clinician.

“Learning to observe students with social cognitive deficits and qualitatively describing their place on the perspective taking spectrum will be an important step toward helping educators and parents better understand the unique needs of their students” (Winner, 2002, p.7).

Currently there are “few sources of data on the interactive conversational behaviors of typically developing adolescents that can be used as guidelines when working with clinical populations” (Turkstra, Ciccio, & Seaton, 2003). If the goal of all treatment programs is to help a student maintain social relationships equal to his or her peers, (Winner, 2003), it is necessary to obtain normative data on how the performance of typical peers compares to students with social pragmatic deficits on the Double Interview Task.

#### *Purpose of the study*

This promising methodology has not been tested in the research arena. Anecdotally, this methodology has proved to be helpful in better understanding the specific needs of individuals with social communication difficulties. The relevancy and usefulness of the Double Interview Task needs to be determined for assessment and intervention purposes. The purpose of this study is to compare the performance of 8-10 year olds with Asperger Syndrome and typically developing peers on the Double Interview Task.

## CHAPTER II

### Methods

#### *Participants*

There were 20, eight to ten year-old participants in this study. Ten who were developing typically and ten who had been diagnosed with Asperger Syndrome based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (American Psychiatric Association, 2000). Of the ten participants with Asperger Syndrome, 5 had typically developing brothers or sisters who also participated in the study. Two of these participants were twins. Participants with Asperger Syndrome, as well as participants developing typically, were recruited from area autism and Asperger Syndrome parent support groups. Table 1 provides participant demographic information.

Table 1: Participant Demographics

*Table 1*

Participants	Age	Gender	Diagnosis
1	10	M	Asperger's Syndrome, ADHD
2	8	M	Developing Typically
3	10	M	Asperger's Syndrome, OCD
4	8	F	Asperger's Syndrome
5	8	F	Developing Typically, ADHD
6	8	M	Asperger's Syndrome
7	9	M	Asperger's Syndrome
8	9	F	Developing Typically
9	8	M	Asperger's Syndrome, PDD, ADHD, Sensory Integration Dysfunction
10	10	M	Developing Typically
11	8	M	Asperger's Syndrome
12	10	F	Asperger's Syndrome
13	8	M	Developing Typically
14	10	M	Asperger's Syndrome/Mild Autism
15	9	F	Asperger's Syndrome, Anxiety
16	9	F	Developing Typically
17	8	M	Developing Typically
18	9	M	Developing Typically
19	9	M	Developing Typically
20	8	F	Developing Typically

Participants 1 and 3; 4 and 5; 8 and 9; 10 and 11; 13 and 14 were siblings

The Autism and Asperger Resource Center provided the investigator with contact information for the leaders of area autism and Asperger parent support groups and the president of the Johnson County Autism Society. Initial contact was made to these individuals via phone. A letter was e-mailed to each of these directors describing the study, needed participants, and contact information for the principle investigator. The letter was then distributed to the individuals on each of the mailing lists. See Appendix A for the introduction letter provided to parents on the mailing lists. Parents with children between eight and ten years of age who were interested in having their child or children participate in the study contacted the investigator by phone or e-mail. At this time, a letter to parents detailing the study as well as a consent and authorization packet including a list of the interview questions, purpose of the study, and human participant rights, were mailed to the families. A self-addressed stamped envelope was included. See Appendix B for the letter to parents providing information about the study.

Participants were also recruited during a parent support group meeting at the University of Kansas Edwards Campus. Parents interested in having their child or children participate in the study were given the information described above. Once the investigator received the signed consent form, she called the family to set up a mutually convenient time and meeting place for the interview to take place. Nineteen of the interviews were conducted at participant's homes and one interview was conducted at the Schiefelbusch Speech-Language-Hearing clinic in Lawrence, Kansas.

### *Procedure*

*Parent questionnaire.* Legal guardians of each of the participants were asked to complete a questionnaire in order to provide more information about their son or daughter. The questionnaire was completed while the double interview task was being conducted (see Appendix C). Some of the information requested on the questionnaire included the child's grade, age, diagnosis(s), who made the diagnosis(s), and the date diagnosed. Other information included a description of the child's communication and social skills, as well as whether or not the child had received or was currently receiving services by a speech-language pathologist, or if the child had ever attended a social skills group. If the answer was "yes" to either of the last two questions, they were then asked to provide more information such as describing current goals and objectives if the child was receiving services, or describing the date, setting, duration, and topics covered during a social skills group.

*Assent.* The principal investigator conducted the Double Interview Task with 20 participants. The investigator followed the assent procedures and protocol. See Appendix D for the assent and Double Interview procedure used by the investigator. The assent procedures provided an overview of the double interview task, gave an approximate duration of the interview task, and informed the participants that if they didn't feel like answering any questions, they didn't have to, and they could stop talking with the interviewer at anytime. The participants were also told that that the interviewer would be happy to answer any questions they had prior to the interview task or during the interview task. They were then asked if they wanted to participate

in the interview. The participants were told that he or she would be interviewed first and then it would be their turn to interview the investigator. A check-list was created and followed to ensure that each participant was provided the same information, asked the same questions, and given the same cues when needed.

*Double interview task.* Interview questions were taken directly from the Double Interview Task (Winner, 2002). The Double Interview Task questions explore concepts such as the quality of the child's friendships, the intensity of their interests, how much they are aware of the people they live with, and the social relationships within their community. After the investigator finished the interview, she verbally summarized the information she learned about the participant. The participant was told that the investigator learned a lot about them, but they didn't know much about the investigator. They were then told it was their turn to learn about the investigator by asking her questions.

*Picture identification task.* Prior to beginning the interview of investigator, the participants were asked to make inferences about three pictures that the investigator provided. The first picture showed the investigator with her family. The participant was asked who he or she thought the people in the picture were. Picture number two showed the investigator with a group of friends. The participant was asked why he or she thought the investigator had a picture of these people. After it was revealed that the people in the picture were the investigators friends, the participant was asked what about the picture made him or her think that the people in the picture were friends. Finally, the third picture showed the investigator with a

friend. Participants were asked who he or she thought the people in the third picture were. After the people in the third picture were identified as the investigator and her good friend or best friend, the participant was asked what about the picture made him or her think that the people in the picture were good friends. Pictures were shown in the same order to all participants. The meaning of each picture was reviewed before the student was asked to interview the investigator.

*Student interview.* After the picture identification task, the student was again told that they would be asked to conduct an interview of the investigator. It was explained that an interview is a time when one person asks questions about the other person in order to find out more about them, and the job of the interviewer is only to ask questions that give information about the other person. The participants were then provided with a list of questions words to assist them in the task. See Appendix E for the list of question words. The participants were reminded that any of the three pictures could be used to think of questions about the investigator. At this time they were told that it was time for the interview of the investigator to start.

*Cueing hierarchy.* A cueing hierarchy as described by Winner, (2002) was used to provide the necessary support to participants. Cues were given when students were only able to produce a limited number of interview questions for the investigator, and were unable to formulate another question. Support was provided from the least facilitating cue through the most facilitating cue. See Table 2 for a description of the cues provided.

## Table 2

### Cues Provided

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The following hierarchy of cues was used:

[CP1] The researcher drew 4 boxes across a piece of paper to provide a visual framework of how many questions the student is to ask before the task is discontinued.

[CP2] The researcher pointed to the pictures on the table and reminded the student that he or she could use the information to ask questions of the researcher.

[CP3] The researcher directed the student to a specific topic that he/she could talk about.

---

### *Data Collection and Coding*

The researcher videotaped all interviews using a VHS camera. The interview was recorded and later transcribed by the researcher. Because the purpose of the study was to examine the participants' social communication, only the portion of the tape when the participant was the interviewer was transcribed. The interview was transcribed and entered into the Systematic Analysis of Language Transcripts (SALT) software (Language Analysis Laboratory University of Wisconsin – Madison, 1984). The transcription of the interview was then coded using specific parameters adapted from Winner (2002). The codes and their definitions are listed in Table 3. See Appendix F for examples of the codes.

Table 3

Definitions of Error Codes

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**Comment Only [CO]**

The individual comments on what he knows rather than formulating questions about what he wants to find out.

**Personal Interest [PI]**

The individual asks questions or gives comments that relate to himself or his interests. The child takes more than one conversational turn relating to his/her personal interest.

**Difficulty Formulating Questions [FQ]**

The individual has difficulty formulating questions to ask the evaluator. This is signaled by sighs of frustration with the activity, awkward silence of more than 2.3 seconds or verbalizing that they are unable to think of questions.

**Shallow Question [SQ]**

The question asked is a closed-ended question, which does not solicit deeper information about the interviewee. The individual fails to provide a follow-up question about the same topic. This code is given to describe the quality of the child's question.

**Diverts Topic [DT]**

The individual diverts the topic to his own experiences, making comments about himself. He takes more than one conversational turn relating to his personal interest.

**Repeated Question [RQ]**

The individual asks the researcher the same questions asked of him. The questions

include:

1. Who is your teacher?
2. What is your favorite thing to do in school?
3. How do other kids at school treat you? What do you do if someone is not being nice? How do you know when they are not being nice? Who are your friends at school? What do you like to do with them?
4. When you are in class what do you like to study the most? Least?
5. What are your hobbies?
6. What do you like to spend most of your time doing? (Alternate question: What did you do at home yesterday?)
7. Who lives in your house? What are their hobbies?
8. What do you have to do at home that you dislike?
9. Do you ever feel embarrassed? What makes you feel embarrassed?
10. Do you have any pets?
11. What chores do you do at home?
12. Who do you play with or hang out with at home? Do you have any neighborhood friends? What do you like to do with them?

### **Revision [R]**

The individual uses false starts and self-interruptions, which change the direction of the question. The revision code is given when the individual uses two or more false starts.

**Unclear Question [UQ]**

The individual asks a question that is unclear in meaning resulting in the researcher asking for clarification.

**Redirected [RD]**

The child is redirected after pauses longer than 3 seconds or to bring the child's focus back to asking questions. After the examiner has redirected the child, the [RD] code is placed after the child's next question.

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*Reliability*

Six interviews were randomly selected for interobserver reliability. This represented 30% of the total interviews. Two graduate students in speech language pathology served as reliability judges, one for transcription and one for coding. Reliability was calculated by dividing the total agreements by the total number of agreements plus disagreements.

Reliability measures were obtained first for transcription and then for coding. The transcription reliability for participant # 1 was 98%, participant # 8 was 100%, participant # 9 was 96%, participant # 10 was 100%, participant # 14 was 97%, and participant # 16 was 100%. The across participant reliability was 98%.

Disagreements in transcription were resolved prior to coding by discussion and review of the videotapes. Intercoder reliability was then used to measure the agreement when the observers assigned codes to the same transcript. The intercoder agreement for participant # 1 was 86%, participant # 8 was 88%, participant

# 9 was 88%, participant # 10 was 88% participant # 14 was 90% and participant # 16 was 88%. The across participant reliability was 88%.

## CHAPTER III

### Results

The purpose of this study was to compare the performance of 8-10 year olds with Asperger Syndrome and their typically developing peers on a social communication assessment, the Double Interview Task (Winner, 2002). Twenty participants, ten who were developing typically and ten who were diagnosed with Asperger Syndrome completed the Double Interview Task.

#### *Quantitative Measures*

The participants with Asperger Syndrome used more utterances and made more errors than did participants developing typically. The number of utterances, number of errors and the overall percent of utterances with one or more errors was compared. See Tables 4, 5, and 6.

Table 4

#### Individual Performance: Participants Developing Typically

Participant Number	Number of Utterances	Number of Errors	Number of Utterances with 1 or More Errors	Percent of Utterances with Errors
2	38	24	18	47%
5	81	10	10	12%
8	58	23	18	31%
10	32	19	11	34%
13	91	21	17	19%
16	23	15	11	48%
17	55	21	17	31%
18	16	6	4	25%
19	65	6	4	6%
20	15	13	10	66%

Table 5

Individual Performance: Participants with Asperger Syndrome

Participant Number	Number of Utterances	Number of Errors	Number of Utterances with 1 or More Errors	Percent of Utterances with Errors
1	45	18	12	26%
3	47	21	14	30%
4	40	12	8	20%
6	61	27	17	28%
7	138	38	27	20%
9	20	19	14	70%
11	134	47	32	24%
12	166	15	13	8%
14	52	17	12	23%
15	63	33	20	33%

Table 6

Number of Errors and Utterances: Across Groups

	Typically Developing	Asperger Syndrome
Number of Utterances	47.4 (26.80)	76.6 (50.01)
Number of Errors	15.8 (7.15)	24.7 (11.43)
Percent of Utterances with Errors	25%	22%

The number of questions asked and the length of interviews was compared across participants. Participants with Asperger Syndrome used more utterances, but asked fewer questions than typically developing participants. See Tables 7, 8, and 9.

Table 7

Interview Questions and Time: Participants Developing Typically

Participant Number	Number of Questions Asked	Length of Interview in Minutes
2	16	5:50
5	32	6:45
8	25	12:30
10	5	5:10
13	21	9:55
16	10	3:50
17	23	7:30
18	8	3:50
19	22	6:10
20	10	6:00

Table 8

Interview Questions and Time: Participants with Asperger Syndrome

Participant Number	Number of Questions Asked	Length of Interview (In Minutes)
1	6	6:40
3	7	5:05
4	8	3:45
6	16	12:30
7	23	13:20
9	12	4:00
11	9	8:00
12	29	12:15
14	12	6:00
15	12	6:40

Table 9

Interview Questions and Time: Across Groups

	Typically Developing	Asperger Syndrome
Number of Questions	17.2 (8.75)	13.4 (7:40)
Length of Interview In Minutes	6:45 (2:41)	7:50 (3:36)

*Qualitative Measures*

Information about the quality of participant’s interviews was obtained by analyzing the types of errors made during the interviews. Overall, participants with Asperger Syndrome made more errors than their peers developing typically. See Tables 10, 11 and 12.

Table 10

Type of Errors: Participants Developing Typically

Error Code	#2	#5	#8	#10	#13	#16	#17	#18	#19	#20
Comment Only	0	0	0	0	0	0	0	0	0	0
Personal Interest	0	0	0	0	1	0	0	0	0	0
Difficulty Formulating Questions	8	0	3	7	7	4	3	2	1	7
Shallow Question	13	5	14	3	4	4	13	2	2	4

Diverts Topic	0	0	0	0	2	0	1	0	0	0
Repeated Question	1	1	4	2	2	1	1	1	3	0
Revision	0	1	0	0	2	1	0	0	0	0
Unclear Question	1	3	0	0	2	3	2	0	0	0
Redirected	0	0	0	3	1	1	0	0	0	1
Cue Provided	1	0	2	4	0	1	1	1	0	1

Table 11

Type of Errors: Participants with Asperger Syndrome

Error Code	#1	#3	#4	#6	#7	#9	#11	#12	#14	#15
Comment Only	0	0	0	1	0	0	0	0	2	0
Personal Interest	0	0	0	1	5	0	0	0	0	1
Difficulty Formulating Questions	8	3	1	9	5	2	13	0	4	7
Shallow Question	1	6	6	7	10	12	11	9	2	10
Diverts Topic	0	3	2	2	2	0	12	3	2	6
Repeated Question	0	4	0	2	7	3	2	3	0	2
Revision	3	0	0	0	1	0	0	0	2	1

Unclear Question	3	1	1	0	4	1	4	0	3	0
Redirected	1	2	1	3	3	0	3	0	1	5
Cue Provided	2	2	1	2	1	1	2	0	1	1

Table 12

Types of Errors: Across Participants

Code	Typically Developing Participants	Participants with Asperger Syndrome
Comment Only	0	3
Personal Interest	1	7
Difficulty Formulating Questions	42	52
Shallow Question	64	74
Diverts Topic	3	32
Repeated Question	16	23
Revision	4	7
Unclear Question	11	17
Redirected	6	19
Cue Provided	11	13

## Chapter IV

### Discussion

This was a study of the social communication of two different groups, children with Asperger Syndrome and age matched peers who were developing typically. The purpose of this study was to compare the performance of these two groups on the Double Interview Task (Winner, 2002) in order to better determine the relevancy and usefulness of this task for assessment and intervention purposes. Both quantitative and qualitative differences were found.

#### *Quantitative Differences*

Overall, results indicated that children with Asperger Syndrome used more utterances, asked fewer questions and had a higher number of errors within their interviews as compared to children developing typically in the same age group. It was not surprising to find marked differences between these two groups based on what is already known about the core social and communicative deficits in children with Asperger Syndrome (American Psychiatric Association, 2000; Klin & Volkmar, 2003; Sillman et al. 2003; Baron-Cohen, 1995). As a group, children with Asperger Syndrome were less effective in their interviews. They talked more, but asked fewer questions of the examiner. This pattern was first discussed by Asperger (1944), in his account of children with Asperger Syndrome. He described them as having a tendency to engage in long-winded, one-sided, sometimes incoherent and rather formalistic speech. The Double Interview Task appears to target the social communication deficit in child with Asperger Syndrome. Winner (2002) describes

the task as exploring an individual's overall ability to shift perspective, organize their thoughts into language that moves in a purposeful direction toward someone else's area of interest, and to formulate questions and follow up with more specific questions to explore another person's interest.

Most of the literature that explores the difficulties that children with Asperger Syndrome have discussed the qualitative differences, such as theory of mind (Baron-Cohen, 1995), central coherence theory (Frith, 1989), and executive dysfunction theory (McEvoy, Rogers, and Pennington, 1993). Through the use of the Double Interview Task, it was possible to compare the differences in social interaction between these two groups quantitatively, which in turn painted a clearer picture of the distinct differences between these two groups. Quantitative information provided through the Double Interview Task is important in the assessment and monitoring of progress for children with Asperger Syndrome. Quantitative differences are useful in gaining an overall idea of performance, but qualitative differences are essential in describing the differences between these two populations.

The percentage of utterances containing one or more errors is an interesting result. Children with Asperger Syndrome had 22% of their utterances containing one or more errors. Children developing typically had 25% of their utterances containing one or more errors. Percent of utterances with errors does not discriminate between groups. Although it is not useful in describing group differences, it would be important to calculate when working with one individual. This measure would be a way to track individual changes over time.

### *Qualitative Differences*

The abstract nature of a social communication disability can only be partly captured quantitatively. The overall quality of the interviews of children with Asperger Syndrome provided a better insight into their difficulties involving social cognition. However, there was a great deal of variance in the kinds of errors made within the interviews of children with Asperger Syndrome. For example, there was variance in the number of errors that children with Asperger Syndrome made during the interview task. While conducting the interviews, some children with Asperger Syndrome's performance on the interview task appeared qualitatively different than their peers who are developing typically while in other children with Asperger Syndrome differences in were difficult to distinguish. There was also a range of performance in children with Asperger Syndrome in the types of errors that were made. For example, the performance of children whose errors were comprised mainly of shallow questions may appear more similar to the performance of children who are developing typically than a child whose errors were in diverting the topic of conversation back to themselves or their own interests. By diverting the topic back to themselves and only taking about their own experiences, the communicative exchange became one-sided and the natural reciprocity of conversation was lost. This supports the understanding that there is a spectrum of theory of mind/perspective taking deficits (Sigman, Yirmiya & Capps, 1995; Yirmiya, Erel, Shaked, Solomonica-Levi, 1998) and that the difficulties that these children have in social communication are uniquely different in each child. The Double Interview Task

(Winner, 2002) can be used to assess how an individual functions on the perspective-taking spectrum based on the individual and their unique difficulties.

Winner (2002) reports that the double interview task explores an individual's overall ability to:

- Shift perspective taking away from thinking about themselves to thinking about others.
- Organize their thoughts into language that moves in a purposeful direction toward someone else's area of interest.
- Formulate questions and follow up with more specific questions to explore another person's interest (p. 187).

Results show that the Double Interview Task does indeed explore these areas.

Differences in the quality of the interviews conducted were shown between children with Asperger Syndrome and children developing typically in the areas of difficulty formulating questions, asking shallow questions, personal interest, diverting the topic back to themselves, repeating a question already asked, revisions, and the need to be redirected. Most likely a combination of deficits in theory of mind (Baron-Cohen, Leslie and Frith, 1985), central coherence (Frith, 1989) and executive function (McEvoy, Rogers, and Pennington, 1993) explain these differences. There appears to be a positive relationship between an individual's theory of mind deficit and their corresponding deficit in central coherence and executive function (Winner, 2002).

A deficit in theory of mind (Baron-Cohen, Leslie, and Frith, 1985) prevents the child from taking the perspective of the person they are interviewing.

Impairments in theory of mind are a major feature of this social and communicative deficit (Silliman et. al, 2003). It may be impossible to determine to what degree theory of mind deficits contribute to these difficulties, but a deficit in this area could contribute to all of the difficulties present during the Double Interview Task for children with Asperger Syndrome. A deficit in theory of mind would most likely lead to difficulty formulating questions due to being unable to consider another's perspective. An individual may then divert the topic back to themselves, repeat a question already asked of them, or ask a question formulated from their own personal interest.

A lack of ability to organize thoughts as to what to ask the interviewee, or difficulty formulating language in order to ask the interviewee questions could be explained by Central Coherence Theory (Frith, 1989). These children may have difficulty organizing the factual information they are gaining from the examiner into a coherent whole. This lack of ability to organize information into a coherent whole could lead to many false-starts or revisions while asking a question, as if the child is unsure of what direction to go in with the question, shallow questions with no further follow-up questions, and repeated questions that the examiner has already asked the child.

Difficulty organizing thoughts and formulating language to ask the interviewee questions may also be explained by a deficit in executive function (McEvoy, Rogers, and Pennington, 1993). Individuals who have a deficit in executive function often have difficulty planning, conducting an organized search,

and flexibility of thought (Ozonoff, Pennington, and Rogers, 1991). They may have difficulty planning for the end result, such as planning which direction to take when asking a question. This difficulty was evident in the number and quality of the revisions used by participants with Asperger Syndrome. Difficulty conducting an organized search and a lack of flexibility in thought could have contributed to the effort that was needed to formulate a question. See appendix G for all questions asked by both groups of participants.

The overall quality of the interviews of children with Asperger Syndrome may be best explained by a deficit in perspective taking. A difficulty assuming another person's perspective and understanding his or her thoughts and feelings (Santrock, 1999) most likely contributes to each of the difficulties shown by children with Asperger Syndrome on the Double Interview Task. If the development of perspective taking does indeed follow a developmental progression (Selman, 1980), it may be that these children are somewhere in the "egocentric viewpoint" of perspective taking. In this stage, the child is able to differentiate between himself and others, but is not able to distinguish between the social perspective (thoughts and feelings) of others and himself (Selman, 1980). This difficulty could account for the difference between groups in diverting the topic back to themselves or their own experiences. Children with a deficit in perspective taking, or at the "egocentric viewpoint" stage of perspective taking would have difficulty understanding that others might not be interested in what they think, or even that others may be thinking something other than what they themselves are thinking. This may explain why the children with

Asperger Syndrome talked more than the group developing typically, but overall asked the researcher fewer and qualitatively poorer questions. The Double Interview Task can be used not only to indicate a difficulty in perspective taking, but also to better understand what degree of difficulty an individual with Asperger Syndrome has with perspective taking. This task can also be used to establish a baseline and then measure improvement in perspective taking after receiving services.

*Formulating Questions.* Children with Asperger Syndrome had more trouble formulating questions to ask the examiner than the children who were typically developing. Overall, it appeared that children with Asperger Syndrome often paused for a longer period of time than the children developing typically and these pauses often appeared more awkward in nature. For example, one child with Asperger Syndrome paused for approximately eight seconds, looking up at the examiner several times and smiling nervously. A child developing typically paused for three seconds and then asked a question without an error. Both of these behaviors were coded as having difficulty formulating questions based on the pause time. Although both of these children appeared to have some difficulty in formulating a question, the child with Asperger Syndrome appeared to be struggling more with the developing a question to ask the examiner.

*Revisions.* Both children with Asperger Syndrome and children developing typically made revisions while asking interview questions, but overall, the participants with Asperger Syndrome made more revisions. Often times participants with Asperger Syndrome had more false starts and self-interruptions within one

question than children who were typically developing. Consider the following two examples. A participant who did not have Asperger Syndrome asked this question:

*“(Um, do you have a favorite), (d\*) where do you guys hang out, your friends?”*

A participant with Asperger Syndrome asked the following question:

*“(And why do you) (why are these) (why d\* yo\*) (why d\*) (what ho\*) what are your hobbies?”* Although these questions were both coded as revisions, the participant

with Asperger Syndrome clearly had a more difficult time formulating the question than did the participant developing typically. The participant with Asperger Syndrome used a number of false-starts and the question seemed to lead in several different directions before “what are your hobbies” was formulated.

*Shallow Questions.* Both groups of participants averaged a high number of shallow questions, however, qualitatively these questions looked different between the two groups of participants. Shallow questions were close-ended in nature and did not solicit deeper information about the researcher with follow-up questions. See Table 11 for examples of shallow questions asked by participants developing typically and participants with Asperger Syndrome.

Table 13

Examples of Shallow Questions

Participants Developing Typically	Participants with Asperger Syndrome
Where were you born?	Are you a vegetarian?
Do you hang out with your friends a lot?	Where is the nearest intersection?
How long did you go to school?	When do you ever go out to eat treats?
What’s your favorite book?	What’s your phone number?

---

Where do you live?

How do you take these pictures of your family, your best friend, and your friends?

---

Although both sets of questions were coded as shallow questions, it appears as if the shallow questions asked by participants with Asperger Syndrome lacked taking the examiners perspective. These questions were all asked without any discussion before or after the question about the topic of the question. The following is a sample of an interview being conducted by the participant with Asperger Syndrome as C and the examiner as E.

*C Do you like working with children?*

*E I do.*

*E That's a great question, it's something I like to do.*

*C (Do do you like), (are) are you vegetarian?*

*E Am I a vegetarian, no I am not.*

*C Who are the best friends that you always like to play with?*

“Do you like working with children” didn’t appear to lack perspective taking, however “Are you a vegetarian?” appeared to lack perspective taking. “Who are the best friends that you always like to play with?” could arguably be a lack of perspective since older people don’t typically “play” with friends.

Based on the idea that there are different stages in the development of perspective taking which extend into adolescence, (Selman, 1980; Steele, Joseph, Tager-Flusberg, 2003) it may be that by the time these participants reach adolescence, participants who are developing typically may ask fewer shallow questions based on a

more developed perspective taking ability. At that time, the quality of the questions asked may show a more pronounced difference. It has been reported that overall deficits in social communication become more apparent over time (DSM-IV-PR; American Psychiatric Association, 2000) .

*Diverted Topic.* The largest difference in quality of questions between the two groups was in the number of times a participant diverted the topic back to their own experience or interest, making comments about themselves instead of asking a question about the researcher. Consider the following example of diverted topic in an interview conducted by a participant with Asperger Syndrome.

*C You mean that you're already graduated from college?*

*E Um hum.*

*C Cool.*

*E I finished college and then I went to graduate school, which is two years after college.*

*C Oh, cool.*

*E Yeah.*

*E I'm about ready to graduate.*

*C I'm four, guess what.*

*E What's that?*

*C I'm four feet by ten, one day when I was at the YMCA indoor pool I touched ten feet.*

*E Oh you did.*

*C Yeah.*

*E Wow.*

*C Yeah.*

*E You've come up with some good questions.*

*C Thanks and my ears didn't pop like mom said they would, okay maybe they popped a little bit.*

*E Yeah.*

*E Can you think of anything any other questions you have for me?*

*C What's your birthday?*

This particular participant diverted the topic back to her own experiences or interests six times during the course of the interview. Participants with Asperger Syndrome diverted the topic as many as twelve times compared to diverting the topic two times in interviews conducted by participants who are developing typically. The large difference in the tendency to divert the topic back to themselves between groups highlights the difficulty that individuals with Asperger have in taking another persons perspective.

*Redirected.* Participants with Asperger Syndrome needed to be redirected more often than participants who are typically developing. A participant was redirected after pauses longer than three seconds or to bring the individual's focus back to asking questions. In the previous example, the examiner redirected the participant by saying "Can you think of anything any other questions you have for me?" after she had diverted the topic of conversation to her own experiences. The

higher number of redirections in the participants with Asperger Syndrome is due to the fact that they had a more difficult time formulating questions and a much higher occurrence of diverting the topic back to their own experiences or interests, so they needed to be redirected back to the task of asking questions more times than the children developing typically.

*Overall Quality.* The error codes used in this study did not account for all of the qualitative differences between these two groups. Some of the questions asked by participants with Asperger Syndrome appeared atypical, but did not fit any of the error code categories. Most of these qualitatively different questions appeared to lack perspective taking.

Often times, after a question such as these, the children with Asperger Syndrome would then divert the topic back to themselves as if the questions were formulated from their own interest instead of from the examiner's perspective. Consider the following examples. Each of the following questions appeared to be created from the child's own personal interest and experiences.

*E Can you think of anything else you'd like to know about me?*

*C How many teeth have you lost?*

*E I've lost all of my teeth.*

*C Yeah.*

*E Since I have all permanent teeth.*

*C Like Marie.*

*E Is that your friend?*

*C Yeah.*

*E Okay.*

*C I think she's lost all her (per\*) too.*

*C I still have a few more to lose.*

*E Oh okay.*

*C And once her tooth fell out at my house.*

*E Oh really.*

*C Yeah, it was summer.*

*E I see.*

*E So can you think of anything else?*

*C No.*

This participant with Asperger Syndrome was redirected at the beginning of this example, asked a question that appeared to lack taking the perspective of the examiner, and then diverted the topic back to her own experiences. A similar interaction is seen in the following example from an interview conducted by a participant with Asperger Syndrome.

*C (Do you) what's your oldest memory?*

*E It was a really long time ago, I think I was five when I was having a birthday party and I was sitting in a swing set out in my back yard.*

*C Um hum.*

*E And all of a sudden I felt something splash on my head, and a bird had gone to the bathroom on my head in my hair.*

*C Cool.*

*E I was not very happy.*

*E I was pretty upset.*

*C Yeah.*

*C You know what one of my oldest memories is*

*E What's that?*

*C I can remember one Christmas when I was really really young and I had wrapped something from little people.*

*E Oh okay.*

*C So.*

*C I think it was the school bus that we have downstairs.*

Compare the previous examples with the following example from an interview conducted by a participant who is typically developing. It could be argued that “Have you been to Disney World” is a question from his own personal interest, however, this participant did not divert the topic back to himself and asked the examiner several questions regarding her experience in Disney World.

*C Where were you born?*

*E I was born in Illinois.*

*E Hinsdalle, Illinois.*

*C I was born in Florida.*

*E Oh, okay.*

*C Have you ever been to Disney World?*

*E I have.*

*E I went when my brother was six, no he was a baby, I guess I was six.*

*E And then we were supposed to go again when he was six and I was eleven.*

*E But then he got sick and we couldn't go.*

*E I was really mad.*

*C Why were you mad?*

*E I was mad because I thought it was his fault we didn't get to go to Disney World.*

*E Because he was sick.*

*C Hum.*

*C How did he get sick?*

*E He has asthma, and I think his asthma was really acting up.*

Although the error codes used in this study captured differences between the two groups, it is important to consider all of the qualitative differences between them in order to have a more complete picture of the difficulties children with Asperger Syndrome have in everyday communication.

#### *Implications for use*

Information gained from using the Double Interview Task (Winner, 2002) can be valuable to families and professionals working with children with Asperger Syndrome. It is important that these difficulties are identified and described early on so that these children may receive the appropriate services and supports for social communication and improved social cognition (Paul, 2003). The Double Interview

Task can capture and describe the social and communication impairment present in individuals with Asperger Syndrome that standardized tests fail to adequately assess.

The Double Interview Task evaluates the students' ability to shift perspective, to organize thoughts into language that moves in a purposeful direction toward someone else's area of interest, and to formulate questions and follow up with more specific questions to explore another persons' interests (Winner, 2002). The Double Interview Task can be used to establish a baseline for these skills, to monitor progress during intervention, and as a post intervention measure.

This study focused on the portion of The Double Interview Task in which the student conducted the interview. This task can be used in its entirety on an individual basis in order to better understand the unique needs of an individual with Asperger Syndrome. The beginning portion of the interview in which the examiner interviews the child can be explored in order to obtain more information about the quality of the individual's friendships, their organizational and problem-solving skills, the intensity of their interests and how much they are aware of the people they live with (Winner, 2002). The picture identification task can also be analyzed in order to explore their ability to read others' faces, ability to account for contextual cues, and ability to make inferences as well as providing more information about their ability to shift perspective. (Winner, 2002). In this study, some of the individuals with Asperger Syndrome had difficulty with the picture identification task. This portion of the task can be used to gain a better understanding of where a particular individual functions on the spectrum of perspective taking abilities. It may be the

case that a child who has difficulty with this part of the task, functions lower on the perspective taking spectrum than a child who does not have difficulty with the picture identification task, but who's difficulties are highlighted during the interview section of the Double Interview Task.

Information obtained from the Double Interview task can be beneficial for education and intervention. The results of the interview provide a specific profile of the child's social communication in a natural setting, which is ideal for designing intervention specific to the child's needs. This information can lead directly to the writing of IEP goals (Winner, 2002). Goals could focus on areas of need, such as increasing perspective taking abilities. The difficulties highlighted from the Double Interview Task (such as having difficulty formulating questions, and diverting the topic of conversation back to themselves) can be used as targets for intervention.

Results from the assessment can be summarized using the Double Interview Analysis Worksheet (See Appendix H). The worksheet allows the speech language pathologist to record the total utterances, total errors, total utterances with errors, and percentage of utterances with errors. The Double Interview Task could be used as a pre and post measure of intervention. The results prior to intervention would be analyzed and then compared to post intervention performance.

### *Limitations*

The number of participants is a limitation in this study with respect to generalization of the results. However, this tool could provide normative data for children who are typically developing and describe the unique difficulties of children

with Asperger Syndrome. It is important to remember that with an individual with Asperger Syndrome social communicative deficit is most apparent during natural conversation. It would be important to include naturalistic observations in an overall assessment of an individual with Asperger Syndrome in addition to a tool such as the Double Interview Task (Winner, 2002). Recruiting from a limited geographical area may be a limit in this study. All of the participants in this study were recruited from the greater Kansas City area. The role of ethnicity is also uncertain in this study, as all of the participants were Caucasian.

#### *Implications for future research*

A study with more participants would provide more normative data for performance on this task in children with Asperger Syndrome. However, Asperger Syndrome is itself a “spectrum disorder” and each child will have unique difficulties. Theory of mind/perspective taking deficits exist on a spectrum as well and therefore no two children will look exactly alike (Sigman, Yirmiya & Capps, 1995; Yirmiya, Erel, Shaked, Solomonica-Levi, 1998). Koning & Magill-Evans (2001) reported that difficulties in social skills and low social perception scores in adolescent boys with Asperger Syndrome became apparent when dealing with the simultaneous presentation of facial, voice, body, and situational cues. The impairments in the use of multiple nonverbal behaviors such as eye gaze, facial expression, body postures, and gestures to regulate social interaction are prominent in individuals with Asperger Syndrome (DSM-IV-TR; American Psychiatric Association, 2000). A future study could document the use of non-verbal behaviors during the Double Interview Task in

order to get a clearer picture of an individuals overall difficulties. Another future area of research might be to investigate the implementation of this assessment tool as part of the intervention process. The Double Interview Task could be given as a pre and post test measure of intervention. This tool could be useful in measuring outcomes of social communication intervention.

### *Summary*

It is common to assume that because these children have adequate, if not superior verbal language skills, that they have the tools necessary to interact with their peers and function in the world around them. This is not the case. Research indicates that these deficits in social communication will only become more apparent with age, further isolating these individuals. (American Psychiatric Association, 2000). These limitations affect not only their ability to form friendships, but also limit their vocational opportunities later in life. Because of their inability to function in an interview and to get along with coworkers, these individuals are often limited to menial jobs that make no use of their many talents (Paul, 2003). It is necessary to uncover and better understand the social communicative difficulties of individuals with Asperger Syndrome so that they may receive the necessary services and supports in order to lead fulfilling lives. The need for intervention is clear. Before intervention takes place, it is first necessary to assess social communication skills.

Based on the findings of this study, it was determined that the Double Interview Task (Winner, 2002) is a clinically relevant and useful tool for the assessment of the social communication deficits associated with children with

Asperger Syndrome. Children with Asperger Syndrome differed in their performance on this task as compared to their age-matched peers. Overall, children with Asperger Syndrome used more utterances to ask fewer questions with less effectiveness, asked more shallow questions, had a tendency to divert the topic back to themselves and their experiences, and asked a large number of questions that related to their own interests.

Speech language pathologists could use the Double Interview Task as a tool to evaluate social communication skills while engaged in the act of conversation. This tool can capture these difficulties children with Asperger Syndrome that may be described as “within normal limits” by their performance on standardized tests, in turn leading to the development of more specific social communication goals for intervention. This study provides information on the social communication skills of typically developing children and those with Asperger Syndrome on the same task, therefore providing a better understanding of the difficulties that children with Asperger Syndrome have in social communication as compared to their age matched peers.

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APPENDIX A  
Introduction Letter to Parents

Dear Parents,

We are students at KU working on our Masters Degree in Speech-Language Pathology. Both of use are members of the Communication and Autism Project (CAP) and spent the summer as counselors at Camp Determination.

Currently, we are conducting research for our theses and would appreciate your help. We are conducting a study focusing on the assessment of social communication skills in children and adolescents. We are seeking participants between **8-10** and **12-14** years of age, with and without Asperger Syndrome.

If your child/adolescent is willing, they would participate in the Double Interview task. This is an informal assessment in which we would interview the child/adolescent, asking questions about school and his/her hobbies. Then, they would have the opportunity to interview us.

The study should take approximately 45 minutes to complete and would be conducted at a site most convenient for the family.

There are many potential benefits to participating in this study. Information from the assessment may be used to better describe areas of social communication difficulties for children with Asperger Syndrome. This could lead to the development of more specific social communication goals for intervention. The participation of typically developing peers will help to develop normative data in the area of social pragmatic assessment.

The results of the Double Interview Task will be shared with you and may be useful to your family as well as your child's educational providers.

If you are interested in participating or if you would like more information, please contact:

Amy Miller  
(913) 558-5409  
[acmill@ku.edu](mailto:acmill@ku.edu)

Kari Zweber  
(785) 749-9363  
[kzweber@ku.edu](mailto:kzweber@ku.edu)

Dr. Jane Wegner, faculty advisor  
(785) 864-4690  
[jwegner@ku.edu](mailto:jwegner@ku.edu)

APPENDIX B  
Information letter to parents

Dear Parents,

My name is Amy Miller and I am a graduate student in speech-language pathology at the University of Kansas. I am conducting a study focusing on the assessment of social communication skills in 8-10 year olds with Asperger Syndrome and their age-matched peers who are developing typically. I am looking for children between the ages of 8 and 10 years of age with and without Asperger Syndrome to participate in this study.

If you choose to participate, your child will participate in the Double Interview Task, developed by speech language pathologist Michelle Winner, in order to assess his/her social communication skills. This is an informal assessment in which I would interview your child, asking questions about school and his/her hobbies. The specific interview questions that will be used are attached to this letter. After I complete my interview, your child will have the opportunity to interview me. The social communication during this interview will then be analyzed.

The assessment should take approximately 45 minutes to an hour to complete and we can schedule the assessment to take place in your home, in at the Schiefelbusch Speech-Language-Hearing Clinic, at the University of Kansas Medical Center, or at an alternate location that is more convenient for you.

The data from the assessment will be analyzed to determine whether there are clear differences in the social communication skills of 8-10 year olds with Asperger Syndrome and their typically developing peers. Information from the assessment may be used to better describe areas of difficulty, therefore leading to the development of more specific goals for intervention. Results of the study may also help determine the relevancy and usefulness of the Double Interview Task for assessment and intervention purposes.

If you are interested in participating in this study, please read the enclosed consent form and send it back to me in the self-addressed stamped envelope provided. After the consent form is returned, I will contact you to schedule a convenient time to complete the assessment.

Please feel free to contact me at any time by phone: (913) 558-5409, email: [acmillier@ku.edu](mailto:acmillier@ku.edu), or mail Schiefelbusch Speech-Language-Hearing Clinic, 2101 Haworth Hall, 1200 Sunnyside Ave., Lawrence, KS 66045. You may also contact my faculty advisor, Dr. Jane Wegner at (785) 864-4690 or [jwegner@ku.edu](mailto:jwegner@ku.edu). We will be happy to provide you with any further information and answer any questions you may have. Thank you for your time and consideration.

Sincerely,

Amy Miller, B.G.S.  
Graduate student  
Speech-Language Pathology

Jane Wegner, Ph.D. CCC-SLP  
Faculty advisor

APPENDIX C  
Parent Questionnaire

Child's name: \_\_\_\_\_ Date of Birth: \_\_\_\_\_

Form completed by: \_\_\_\_\_ Relationship to child: \_\_\_\_\_

Date: \_\_\_\_\_ Phone: \_\_\_\_\_

Grade: \_\_\_\_\_ Age: \_\_\_\_\_

Diagnosis(s): \_\_\_\_\_ By whom: \_\_\_\_\_

Date Diagnosed: \_\_\_\_\_

Please describe your child's communication:

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Describe you child's social skills:

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Is your child currently receiving services by a Speech-Language Pathologist? If so, please describe current goals and objectives:

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Has your child ever attended a social skills group? If so, please describe (date, setting, duration, and topics covered).

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APPENDIX D  
Assent and Double Interview Procedure

My name is Amy and I go to school at the university of Kansas. I am interviewing boys and girls that are about 8, 9, or 10 years old.

***Assent Procedures-***

I am interested in learning more about you, so I would like to take turns interviewing each other. The interviews should take about 45 minutes. They may take a little bit more time, or a little bit less time. I would like to ask you some questions about school, home, and your hobbies and how you feel about these things. If you don't feel like answering any questions, you don't have to, and you can stop talking with me at anytime and that would be fine. I will be happy to answer any questions you may have now or when we are talking together. Do you want to take turns interviewing each other?

I will interview you first, then it will be your turn to interview me.

***Interview Questions:***

1. Who is your teacher?
2. What is your favorite thing to do in school?
3. How do other kids at school treat you? What do you do if someone is not being nice? How do you know when they are not being nice? Who are your friends at school? What do you like to do with them? (*Explore the quality of their friendships. Are they real friends or classmates?*)
4. When you are in class what do you like to study the most? Least?
5. What are your hobbies?
6. What do you like to spend most of your time doing? (Alternate question: What did you do while you were at home yesterday?) (*Explore the intensity of their interests.*)
7. Who lives in your house? What are their hobbies? (*Explore how much they are aware of the people they live with.*)
8. What do you have to do at home that you dislike?
9. Do you ever feel embarrassed? What makes you feel embarrassed?
10. Do you have any pets?
11. What chores do you do at home?
12. Who do you play with or hang out with at home? Do you have any neighborhood friends? What do you like to do with them? (*Explore their social relationships within their community.*)

“I interviewed you by asking you questions and I learned a lot about you today. I learned you: (have brother/sister, like/don't like, teacher...)  
I learned a lot about you, but you don't know very much about me. Now it's your turn to learn about me. I just interviewed you by asking you a bunch of questions about you, now you get to ask me a bunch of questions to find out about me. (Put the

pictures on the table). These pictures belong to me. You may ask me about any of these pictures on the table or what you might be wondering about me.

Before you start to interview me, I would like for you to tell me about these pictures that I brought. (Have the student identify interviewer in each picture)

Picture #1 shows the investigator with her family

Picture #2 shows the investigator with a group of friends

-Why do you think I have a picture of these people?

Picture #3 shows the investigator with a friend.

\*by the completion of the picture task, make sure the student has a clear understanding of the pictures.

Review meaning of the pictures

You will be asked to find out about me by doing an interview. An interview is a time when one person asks questions about the other person in order to find out more about them. The job of the interviewer is only to ask questions that give information about the other person. These are some words we can use to start a question: who, what, when, where, why, how, do you). Before we talked about the pictures, I had just finished interviewing you. You can use any of these pictures to think of questions about me. (Point to the pictures).

Tell the student it is time for the interview of me to start. (Provided needed wait time). Use cueing hierarchy if needed.

APPENDIX E  
Question Words

## **Question Words**

**Who**

**What**

**When**

**Where**

**Why**

**How**

**Do you**

APPENDIX F  
Examples of Error Codes

**Comment Only [CO]**

The individual comments on what he knows rather than formulating questions about what he wants to find out. For example:

*E Do you want to know anything about my hobbies?*

*C Probably one of your hobbies is hanging out with your friends [CO].*

**Personal Interest [PI]**

The individual asks questions or gives comments that relate to himself or his interests. The child takes more than one conversational turn relating to his/her personal interest. For example:

*C Do you go on AOL Instant Messenger [PI]?*

*C Do you watch Aqua Teen Hunger Force [PI]?*

**Difficulty Formulating Questions [FQ]**

The individual has difficulty formulating questions to ask the evaluator. This is signaled by sighs of frustration with the activity, awkward silence of more than 2.3 seconds or verbalizing that they are unable to think of questions. For example:

*C I can't think of any more questions [FQ].*

**Shallow Question [SQ]**

The question asked is a closed-ended question, which does not solicit deeper information about the interviewee. The individual fails to provide a follow-up question about the same topic. This code is given to describe the quality of the child's question. For example:

*C Who are you [SQ]?*

*E Well, my name is Kari.*

*C Now where do you live [SQ]?*

*E I live in Lenexa, Kansas.*

(Child does not ask any further questions related to the initial question. He moves on to a new line of questioning.)

**Diverts Topic [DT]**

The individual diverts the topic to his own experiences, making comments about himself. He takes more than one conversational turn relating to his personal interest. For example:

*C Um what about your sister, what's she like?*

*E She's a private pilot so she flies planes.*

*C Oh, ok.*

*C Sounds kind of like my grandma (only she) yeah my grandma loves to*

*travel [DT].*  
*E Really?*  
*C Yeah she travels all the time, like she'll be oh (we're) I'm in Phoenix*  
*Arizona*  
*and oh I'm in Rhode Island or something.*  
*C It's great when she comes to visit.*

### **Repeated Question [RQ]**

The individual asks the researcher the same questions asked of him. The questions include:

1. Who is your teacher?
2. What is your favorite thing to do in school?
3. How do other kids at school treat you? What do you do if someone is not being nice? How do you know when they are not being nice? Who are your friends at school? What do you like to do with them?
4. When you are in class what do you like to study the most? Least?
5. What are your hobbies?
6. What do you like to spend most of your time doing? (Alternate question: What did you do at home yesterday?)
7. Who lives in your house? What are their hobbies?
8. What do you have to do at home that you dislike?
9. Do you ever feel embarrassed? What makes you feel embarrassed?
10. Do you have any pets?
11. What chores do you do at home?
12. Who do you play with or hang out with at home? Do you have any neighborhood friends? What do you like to do with them?

### **Revision [R]**

The individual uses false starts and self-interruptions, which change the direction of the question. The revision code is given when the individual uses two or more false starts. For example:

*C Why are these, why d\* yo\*, why d\*, what ho\*, what are your hobbies [R]?*

### **Unclear Question [UQ]**

The individual asks a question that is unclear in meaning resulting in the researcher asking for clarification. For example:

*C Did you move at all [UQ]?*  
*E Um, like move states?*  
*C Yeah you know or other streets.*

**Redirected [RD]**

The child is redirected after pauses longer than 3 seconds or to bring the child's focus back to asking questions. After the examiner has redirected the child, the [RD] code is placed after the child's next question. For example:

*E Can you think of any other questions?*

*C Hmm.*

*C Why do you like to swim [RD]?*

APPENDIX G  
Questions asked by participants

## Questions asked by typically developing children

### Participant #2

1. Do you live by Mary?
2. Do you live by Brad?
3. Do you live by John?
4. Does your dad live somewhere else?
5. Like in a different house?
6. (Does um) does he, your best friend live by you?
7. What's your favorite color?
8. What's your second favorite color?
9. What's your third favorite color?
10. (Do you know your) (um), what's your (fav\*) fourth favorite color?
11. Where do you live?
12. Who's your second best friend?
13. Who's your third best friend?
14. Who's your fourth best friend?
15. Who's your fifth best friend?
16. Do you have a pet?
17. What are their names?
18. What was the first one's name?

### Participant #5

1. Do you have any pets at your home?
2. You do, what's their names?
3. Um, where do you live?
4. Okay, what is your favorite place to go there?
5. (Um, do you have a favorite), (d\*) where do you guys hang out, your friends?
6. (What's your) what is your favorite movie you've ever seen in a movie theatres?
7. In the movie theatres?
8. (Why um), why haven't you found a boyfriend?
9. What's his name?
10. Are you like engaged?
11. So (have you) are your parents giving you detail about someone to marry?
12. Okay, how old are you?
13. When is your birthday?
14. (Have you) what's one of your favorite teachers?
15. When you were in, can you remember in kindergarten?
16. Was she, she never been mean to you?
17. (What's your favorite thing in), what's your favorite thing in (in) second grade?
18. What's were the activities?
19. The library?
20. When did you guys meet?
21. So that's when you met?
22. How many years ago?
23. What's your favorite flower?
24. What's your favorite color?
25. (What) what's in the bedroom that you really like?
26. What's your favorite stuffed animal?
27. What was your favorite present, it can be any time, what was your favorite present at Christmas?
28. This one?

29. Oh, what's your favorite food?
30. I mean what's your favorite food?
31. (Um) does your brother annoy you?

**Participant #8**

1. How old are you?
2. (Um), who is your teacher?
3. Do you hang out with your friends a lot?
4. What's your favorite color?
5. What is your favorite thing in school?
6. Which one do you not like?
7. Where do you live?
8. (Um), what do you do on the weekends?
9. Do you hang out with your family (family) a lot?
10. Do you want to go to school?
11. When will you get out?
12. Like what month?
13. (Um), what's your favorite sport?
14. What's your favorite book?
15. What do you do during the summer?
16. Um, what state do you wish you could go to that you haven't been to?
17. Out of these friends which one do you play with the most?
18. Why don't you like math?
19. Do you like science?
20. Have you ever had a pet?
21. What kind of car do you drive?
22. What car do you wish you have that you don't have?
23. (Um), what's your favorite food?
24. What's your least favorite food, like something you don't like?
25. Has your brother ever embarrassed you in front of your friends at all?

**Participant #10**

1. What's your favorite subject in school?
2. What are your hobbies?
3. (Um, do you) do you do a lot of stuff with your friends?
4. Do you spend a lot of time with your family?
5. Do you play with your (bro\*) brother?

**Participant #13**

1. When is your birthday?
2. Why are you interviewing me right now?
3. (When) (when do yo\*), when do you get embarrassed?
4. What's your favorite color?
5. (Um), (where), where were you born?
5. Do you have any pets?
6. What's what are their what are their names?
7. (Um), (who is) (who is) (who is) another good friend of yours?
8. (How), (how um), how are your feelings around other people?
9. (Um um) (how) how do you like school right now?
10. (Um), what grade are you in?
11. (Um) (where did you) (where did you) I mean what hospital where you born (in) in?
12. (Um), (do you) (do you have like) are you married yet?

13. How old are you?
14. (Um) (um) who do you think you're gonna marry?
15. Are you gonna marry him?
16. (Um) (um) (what) (what is) (what is the) (what) what does the flag of over X Europe look like, how should you describe it?
17. (Um) (do you) (do yo ha) when you moved here were you on the other side of the ocean (or were you) or was it still over here like on this side of right up here USA?
18. Still?
19. (Um), have you ever been to the Mississippi?
20. No like have you ever been to any other state like about five hours away?
21. Have you ever came in a wreck before?

**Participant #16**

1. (Um), what's your brother's name?
2. (Um, what was your best) what is your best friend's name?
3. (How old's your), how old's Peter?
4. (Um), did you go to school with each other when you were a little kids?
5. Do you go to school with any of your other friends?
6. Where were you (wi\*) (wi\*) with your family?
7. What are your hobbies?
8. What's your brother's hobbies?
9. (Um), (what were) what's your favorite thing to do in school?
10. Like, what are your favorite animals?
11. (Um), (what was your), what's your mom's favorite hobby?

**Participant #17**

1. Do you like your brother?
2. Why did you go to KU?
3. How did you get around?
4. When do you like to spend time with your brother?
5. What do you like to eat?
6. Who are your friends?
7. Well, how much do you like your brother?
8. What is your address?
9. Who do you like to eat with?
10. Why do you like your brother?
11. What is your favorite place to eat?
12. Do you like lasagna?
13. Garfield likes lasagna.
14. (Um), where did you go (to el\*) for elementary school?
15. Where did you go for middle school?
16. Where did you go in high school?
17. And I've got to go to Trailridge too.
18. Where were you born?
19. Have you ever been to Disney World?
20. Why were you mad?
21. How did he get sick?
22. Do you like Pringles?
23. Who's that in the picture?
24. Where you at Minnesota when you were doing that?
25. Is Minnesota cold?
26. Is your brother weird?

**Participant #18**

1. (Um) What do you like to do?
2. Where were you in that picture?
3. What do you like to do at your house?
4. Um, do you like your brother?
5. Do you ever like go to movies with him or something?
6. Do you have a car?
7. (What do you), (what) what did you do when you were in Australia?
8. What (col\*), (um), what college do you think you might go to?
9. What college did you go to?
10. Why did you go to Kansas?

**Participant #19**

1. Okay, where does your parents live?
2. From here?
3. Where do you live?
4. With your brother?
5. (Um), (hum), where was this picture taken?
6. Do all of them live in Australia except for you?
7. (Did you already) know em?
8. Where is this picture taken?
9. Did you see the Chiefs and the Minnesota Vikings game?
10. What's your favorite thing to study?
11. Do you have homework?
12. Oh yeah, what's your teacher's name?
13. Okay, (what's), oh what's your favorite thing in school?
14. Do you get recess?
15. Well do you get like gym class or something?
16. What do you want to be when you grow up?
17. Oh, when were these pictures taken?
18. So you were nineteen?
19. (And he) was eighteen?
20. When was this one taken?
21. What time was it?

**Participant #20**

1. What is his name?
2. Do you see him a lot?
3. (Um), how long did you go to school?
4. (Um) do you have any more friends than these?
5. So you don't see them very much?
6. Um, do you have any like cousins or aunts?
7. (Um) do you do any sports?
8. (Um), do your grandmas live near you?
9. Um, do you do any fun things in school?
10. (Um) do you do any special stuff (for your) for your birthday in your family?

## Questions asked by children with Asperger Syndrome

### Participant #1

1. Okay (um), (well um), did you have any (um) trouble (bef\*) in (um) middle junior high or high school?
2. Like (di\* um), (was yo), were any of your teachers kind of harsh?
3. How about your social studies?
4. Um, well was college fun for you because (um) everything (um) was better than it was because (you can) you could get (g\*) gum or (so\* or so\* um), stuff like that (for um), (for cheep pri\*) for only a (a) few nickels?
5. (Um), well (um) when you were like a kid, was it fun for you?
6. (Um), did all of these pictures take place in the same town or county?
7. (Your fa\*) (your from) (um wait) (were um) (when yo\*) when you were in New Zealand, were you (um) there for awhile, or were you just taking a vacation?
8. Did it get annoying in Australia where (um), all of those people (are like) are like calling you mate?

### Participant #3

1. What pets do you have?
2. What else?
3. What pets did you have when you were a kid?
4. Who's that, who's that, who's that, and who's that?
5. (Wh\*) what's their hobby?
6. Uh, what's his hobby?
7. What's your brother's hobby?
8. Does he have a girlfriend?
9. Her name?
10. What do you like best about your mother?

### Participant #4

1. Um, well how many friends you got in all?
2. (Um, um) how old you are?
3. Um, how many cousins you got?
4. And how many grandma's you got?
5. Um, which kind of food do you like?
6. What's your favorite food?
7. What do you always dream of?
8. Um, what is your favorite restaurant?
9. So (um), do you like meeting new people?

### Participant #6

1. Do you have any pets?
2. What are your favorite hobbies?
3. (Where), where is your favorite place you've been?
4. How do you get around?
5. What kind is it?
6. What's a warrantee?
7. When do you like play?
8. When is your birthday?
9. How do you know when you're sick?
10. What is your favorite (fa\*) food (restaurant), restaurant?
11. What's your favorite restaurant?
12. What is your favorite movie?

13. (Has), (have yo\*) has somebody stole something of yours?
14. How long have you been doing this?
15. Where is the nearest intersection?
16. What is your favorite animal?
17. What is your favorite food?

**Participant # 7**

1. Now, X, who is your brother, your father and your mother?
2. (Yeah who is your father your mother), (wh\*), okay I mean what is the name of your brother your father and your mother?
3. Now, where do you live?
4. Who is your teacher?
5. Now, when were your born?
6. Why are these four (your best), your friends?
7. Why are they your friends?
8. (Now, what), now who is your best friend?
9. I know, but what's his name?
10. What do you enjoy doing?
11. Yeah, what chores do you like doing?
12. What chores are you okay with, ya know?
13. What do you hate doing?
14. Did you move at all?
15. Okay, do you have any enemies, you know, people that pick on you?
16. Why did you move?
17. Okay, what topic do you like doing?
18. (Wa\* okay), (what's okay), what things are you good at?
19. (Who's your teach), who's your teacher?
20. Alright, what do you hate doing?
21. (I, oh, wait), what is your favorite food?
22. Now, what foods do you not like?

**Participant # 9**

1. (What favorite thing) what favorite subject do you like to do?
2. Do you like working with children?
3. (Do do you like), (are) are you vegetarian?
4. Who are the best friends that you always like to play with?
5. (Do you) when do you ever go out to eat treats?
6. When do you ever go out to eat treats?
7. Where do you buy your food?
8. (How do) how do you do when you drive around in a car, do you ever (do you ever) get mixed up on which way to turn?
9. Where do you live?
10. What's your phone number?
11. What's your address?
12. Do you have pets?
13. Do you like doing sports?
14. Do you eat pizza?

**Participant # 11**

1. Um, what is your best friend's name?
2. Where do you live?
3. Like right over there?
4. What is your hobby?

5. What is your very favorite hobby?
6. (How far does Peter live away from yo\*) how far away does Peter live away from you?
7. (Are these all of your) are these all of your friends?
8. How old were you when you met Peter?
9. What year were you born?
10. What is your favorite color?
11. (Do you know that) do you know that my hair and my eyes match?

**Participant # 12**

1. Who is your teacher?
2. Is she nice?
3. Who is the worst teacher that is probably on your worst list at school?
4. Like just a little mean ones?
5. Um, what's your favorite subject?
6. Um, is your brother mean to you?
7. Okay (um), (um) who's like the weirdest boy in your class do you think?
8. What about anyone in your, like in the past?
9. What did they do?
10. (Um), who's your least favorite friend in that picture?
11. And does he go to the same school as you right now?
12. Or is he in Australia?
13. Where's your favorite place to go on vacation?
14. What's your least favorite subject in school?
15. Um, what is the kind of pet that you wish you had but you can't get?
16. Um, where did you used to live that your brother and all your parents are in that one picture?
17. Have you ever gone in the Sears Tower?
18. Do you enjoy school or do you want to get out of it like right now?
19. And if you had the choice of (we\* not like) if you couldn't become like a doctor like a therapist that you want to become what would you do?
20. What is a personal trainer?
21. So (um) were your parents mean to you when you were growing up?
22. And did you have any like pets when you were younger that you really loved?
23. What color are the labs?
24. What's your favorite food?
25. What's your favorite sport?
26. Like rowing as in like boats?
27. I can't tell, but is your hair short or long?
28. Oh like, so your hair's naturally curly?
29. So how do you straighten it?

**Participant # 14**

1. (Who) (who are those) who are your mom and dad?
2. No, like (ah), what are their names [SQ]?
3. Your best friend's name is?
4. Why do you have all these best friends?
5. But you?
6. (How) how do you take these pictures of your family your best friend and your friends?
7. Your camera?
8. Uhhuh.
9. Which camera?
10. Do you love em, (do you love your) (you love your fr\*) do you love your family, your best friend and your friends?
11. And do you love your brother?

12. Is he a pest sometimes?
13. Bothering you a lot?
14. (Okay, then how) (okay, okay, okay) (when was your picture devel\*) (when was your best fr\* pic\* pic\* your fr\*) what year was your picture taken with your friends?
15. Okay, then, can't think of a word, (where) (where) where do you go when you met your friends?

**Participant # 15**

1. Um, when was this picture taken?
2. And what is your best friend's name?
3. (And why do you) (why are these) (why d\* yo\*) (why d\*) (what ho\*) what are your hobbies?
4. (Wh\*) (what is your fa\*) what's your favorite instrument?
5. When was this picture taken?
6. So who took this picture?
7. Which grade are you in?
8. You mean that you're already graduated from college?
9. What's your birthday?
10. How many teeth have you lost?
11. What's the name of the graduate school you're going to?
12. Do you like to roller skate?
13. (Do you) what's your oldest memory?
14. What's your favorite subject in school?

APPENDIX H  
Double Interview Analysis Worksheet

Student's Name \_\_\_\_\_

Date \_\_\_\_\_

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DOUBLE INTERVIEW ANALYSIS

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Comment Only \_\_\_\_\_

Personal Interest \_\_\_\_\_

Difficulty Formulating Questions \_\_\_\_\_

Shallow Questions \_\_\_\_\_

Diverts Topic \_\_\_\_\_

Repeated Questions \_\_\_\_\_

Revision \_\_\_\_\_

Unclear Questions \_\_\_\_\_

Redirected \_\_\_\_\_

Cues Provided \_\_\_\_\_

---

Total Utterances \_\_\_\_\_

Total Errors \_\_\_\_\_

Total Utterances with Errors \_\_\_\_\_

Percentage of Utterances with Errors \_\_\_\_\_

APPENDIX I  
Interview Conducted by a participant developing typically

\$ CHILD, EXAMINER

+ Name: S.M.

+ Gender: M

+ DOE: 1/18/2004

+ CA: 9;2

+ Context: CON

+ Examiner: Amy Miller

+ Transcriber: Amy Miller

- 0:00

[CO] Comment only

[PI] Personal Interest

[FQ] Difficulty formulating questions

[SQ] Shallow Question

[DT] Diverts Topic

[RQ] Repeated Question

[R] Revision

[UQ] Unclear Question

[RD] Redirected

[CP] Cue Provided

C Okay, where does your parents live?

E They live in Lenexa.

E So it's about twenty, twenty minutes away or so from here.

C From here?

E Uhhuh.

C Where do you live?

E I live with my parents right now.

E I live at home.

C With your brother?

E Uhhuh.

E Yep.

C Your brother's eighteen.

E Yep.

C Well Gary says when I'm eighteen, I'm moving out of the house.

E This is um, my brother's still in high school, so he'll, he's almost graduated, when he graduates, he'll um he'll go to college and so he'll move out.

E And I did move out, but then I moved back home just recently because I only have one year of school left, to save money.

E And they said it was okay, I think they kinda like having me around.

C Ohh.

E Some days.

C (Um), (hum), where was this picture taken?

E This picture was taken in Australia actually.

C Do all of them live in Australia except for you?

E I actually studied there I went to school there for six months.

C Oh, yeah when you told me that you studied there.

E Yeah I did and this is, they were all studying there too.

E So they're all from um, South Carolina.

E So they live in South Carolina but they were in Australia studying at the same time I was.

E So we were all friends while we were there.

E That's a <good question Sam>.

C <Did you already> know em?

E I didn't, I met them when I was there.  
 C Oh.  
 C Where is this picture taken?  
 E This picture's taken in Minnesota.  
 C Did you see the Chiefs and the Minnesota Vikings game?  
 E Yes, I did.  
 C The Chiefs totally lost.  
 E I actually was at a um, my best friend's um, family Christmas in Minnesota watching the Chief's game.  
 E So I was kind of teasing em and I said oh this is going to be so embarrassing for you guys, you're gonna loose, it was a whole house full of Minnesota Vikings fans and me.  
 C And guess who loose.  
 E Yeah, yeah.  
 E That was an, that was pretty embarrassing actually.  
 C Um.  
 E Those are good questions Sam.  
 C What's your favorite thing to study [RQ] [SQ]?  
 E Um, I liked English, I like to read a lot, so I liked English.  
 E Um, yeah.  
 C {Yawning}.  
 C Do you have homework?  
 E Tonight or just in general?  
 C Yeah.  
 E Which one?  
 C General.  
 E In general.  
 E Um, yeah I do.  
 E I have a lot of homework, or like stuff I have to work on.  
 E Like I'm writing this thesis so I have to work on that like every single day.  
 E A little bit, some days more some days less.  
 C Okay.  
 C Um, I can't think of any more [FQ].  
 E How about can you think of.  
 C Oh yeah, what's your teacher's name [RQ] [SQ]?  
 E Well, I have lots of different teachers.  
 E But one teacher's name is Jane, Doctor Jane Wegner.  
 C <What's>.  
 E <She's kind of> my supervisor.  
 C Oh.  
 C Okay, (what's), oh what's your favorite thing in school [RQ]?  
 E Um, like other than my favorite subjects?  
 C Uhuh.  
 C Like, like I said recess.  
 E Um, well when I was I was.  
 C Do you get recess?  
 E Uhuh.  
 E But when I was younger I loved recess.  
 E I like to play sports.  
 E So I liked recess.  
 C Well do you get like gym class or something?  
 E {shaking head "no"}.  
 C I'm not going to college.  
 E {laughing}.

E You're not going to college.  
E You can take classes.  
E You can take whatever classes you want.  
E So I've kind of chosen, choose to take like a different class.  
C What do you want to be when you grow up?  
E I want to work with kids that are like preschool age I think, like three to five.  
E And do kind of like early intervention like.  
C They're wild.  
E They are wild.  
E To work with kids that have like autism, or down syndrome.  
E Work with the kids and their families.  
E Maybe live in Australia <some day>.  
C <Cause>, cause I want to be a football player when I grow up and play for the Chiefs.  
E Cool.  
C {Waving}.  
C (Hi mom, is that one going to be on TV)?  
E No, it's not going to be on TV.  
C Oh.  
C Okay, that's all I have to ask about you.  
E Can you think of anything else that you'd like to know about me?  
C Oh, when were these pictures taken?  
C {Reading date on back of picture}.  
C Two, <twenty five>.  
E Um <this> this was actually taken fall of my junior year of college.  
E So about four years ago.  
E And um it was taken by like a pro\* professional photography company.  
C So you were nineteen?  
E About.  
E <Uhhuh>.  
C <And he> was eighteen?  
C No.  
E No.  
C He was fourteen.  
E Uhhuh.  
E No.  
C Yeah.  
C Eighteen minus four.  
E My brother's five years younger than I am.  
C Oh, but you said this was four years ago.  
E This, the picture was taken four years ago.  
C Ohh.  
E My brother's five years younger than I am.  
C When was this one taken?  
E Um that was actually taken just a couple months ago.  
E It wasn't taken that long ago, does it say the date?  
C Oh a Minnesota game.  
E Uhhuh.  
E Well it wasn't that game, but actually you know what?  
E I think it was that weekend that that picture was taken.  
E I don't know if the date would be right.  
E So there's no, there's no date.  
C Okay and this one was.  
C {Looking at date on the picture}.

C Okay.  
E Those are some good questions.  
E Yeah, this is taken, this is taken my junior year of college.  
E This is taken in the fall.  
E This is taken my junior year of college in the spring.  
E And this is taken just a couple of months <ago>.  
C <Summer>.  
E Actually is was um.  
C Winter.  
E Yeah.  
E Yeah just.  
C Spring.  
E What, what would you guess by looking at the picture?  
C Winter.  
E Yeah.  
E Our outfits and <XX>.  
C <No he> acts like it's warm.  
E It's a long sleeve shirt.  
E But yeah I was getting ready to go outside so I had my scarf and my jacket on.  
C You were about to leave?  
E Uhhuh.  
C What time was it?  
E Oh, I don't remember Sam probably like two in the afternoon maybe, three, I don't know.  
C I was asleep.  
E You were sleeping?  
E Is there anything else about me that you'd like to learn or any other questions you'd like to ask?  
C Um, no.

APPENDIX J  
Interview Conducted by a participant with AS

\$ CHILD, EXAMINER  
+ Name: K.W.  
+ Gender: F  
+ DOE: 1/16/2004  
+ CA: 9;3  
+ Context: CON  
+ Examiner: Amy Miller  
+ Transcriber: Amy Miller  
- 0:00

[CO] Comment only  
[PI] Personal Interest  
[FQ] Difficulty formulating questions  
[SQ] Shallow Question  
[DT] Diverts Topic  
[RQ] Repeated Question  
[R] Revision  
[UQ] Unclear Question  
[RD] Redirected  
[CP] Cue Provided

C Um, when was this picture taken [SQ]?  
E That was taken when I was a junior in college, so about three years ago.  
C Wow.  
E Yeah.  
C And what is your best friend's name [SQ]?  
E His name is Peter.  
C (And why do you) (why are these) (why d\* yo\*) (why d\*) (what ho\*) what are your hobbies [R]  
[SQ] [RQ]?  
E Um, that's a good question.  
E My hobbies are I like to swim, um I like to play sports, like volleyball, stuff like that, um I like to read, and sometimes I like to play the piano.  
C Cool.  
E Yeah.  
C (Wh\*) (what is your fa\*) what's your favorite instrument?  
E My favorite instrument.  
E I think the harp is the most beautiful instrument.  
C Yeah.  
E I think that's a really pretty instrument.  
E I don't know how to play it, but I think it's really beautiful.  
E I like to listen to it.  
C When was this picture taken [SQ]?  
E That was also taken my junior year.  
E So I think this is taken in the fall and this picture was taken in the spring.  
E So yeah, about three or four years ago.  
C Yeah.  
E And it was taken at a park.  
E Sitting on a bridge.  
C Yeah.  
E Like a <sitting on a bridge>.  
C <I have> a school pictures [DT].  
E Oh you do.  
C Yeah.

C At Maranatha.  
E I see.  
C So who took this picture [FQ] [SQ]?  
E Um Locklear photography, which is why the name is in the corner.  
E That's like a professional photography company.  
E So you can go and pay money and they'll take professional pictures for you.  
C Yeah, I think we used one, I think we used a company which was Austin [DT].  
E Oh okay.  
E Yeah, so that's who took that picture.  
C [FQ].  
E That's a good question.  
C Yes.  
C Which grade are you in [FQ]?  
E I am in graduate grade, so it's about eighteenth grade I guess.  
E It's after, after college.  
C You mean that you're already graduated from college?  
E Um hum.  
C Cool.  
E Yeah I finished college and then I went to graduate school, which is like two years after college.  
C Oh, cool.  
E Yeah.  
E I'm about ready to graduate.  
C I'm four, guess what [DT].  
E What's that?  
C I'm four feet by ten, one day when I was at the YMCA indoor pool I touched ten feet.  
E Oh you did.  
C Yeah.  
E Wow.  
C Yeah.  
E Holy cow.  
C Yeah.  
E You've come up with some good questions.  
C Thanks and my ears didn't pop like mom said they would, okay maybe they popped a little bit [RD] [DT].  
E Yeah.  
E Can you think of anything any other questions you have for me?  
C What's your birthday [FQ] [SQ] [RD]?  
E My birthday is May 7th, 1980.  
C Cool.  
E Yeah.  
C [FQ].  
E That was a good question.  
C Thanks.  
E You're welcome.  
E Can you think of anything else you'd like to know about me?  
C How many teeth have you lost [SQ] [RD] [PI]?  
E I've lost all of my teeth.  
C Yeah.  
E Since I have all permanent teeth.  
C Like Marie [DT].  
E Is that your friend?  
C Yeah.  
E Okay.

C I think she's lost all her (per\*) too.  
C I still have a few more to loose.  
E Oh okay.  
C And once her tooth fell out at my house.  
E Oh really.  
C Yeah, it was summer.  
E I see.  
E So can you think of anything else?  
C No [RD].  
= CP1.  
C What's the name of the graduate school you're going to [FQ] [SQ]?  
E It's the University of Kansas, it's KU.  
E I did my college there.  
E The program, part of it is in Lawrence where KU is, and part of it is downtown, at the medical center.  
E So it's in different places.  
E That's a good question.  
C Thanks.  
C Do you like to roller skate [SQ]?  
E I do, I um, I used to like to roller skate a lot when I was younger I remember I used to go to skating parties and that kind thing.  
E I got some roller blades for my birthday this year.  
C Cool.  
E And I was trying to learn to roller blade.  
E And I did okay, but one time I took them to Minnesota, I was staying at a friend's house and I tried to go down a hill, a huge hill, and at the bottom of the hill there was a lake.  
E I almost fell in the lake.  
C Yeah.  
E Yeah.  
E So I still need some practice.  
C Yeah.  
E So when it gets warmer I'll have to practice more.  
C So that's the second question.  
E That was a good question.  
C Thanks.  
C (Do you) what's your oldest memory?  
E My oldest memory.  
E I remember being, I think I was five, from when I was youngest, is that what you're asking?  
C Like what's the memory that you can remember that's the oldest memory.  
E Um, maybe there's one before this, but the one I remember, it was a really long time ago, I think I was five when I was having a birthday party and I was sitting in a swing set out in my back yard.  
C Um hum.  
E And all of a sudden I felt something splash on my head, and a bird had gone to the bathroom on my head in my hair.  
C Cool.  
E I was not very happy.  
E I was pretty upset.  
C Yeah.  
C You know what one of my oldest memories is [DT].  
E What's that?  
C I can remember one Christmas when I was really really young and I had wrapped something from little people.  
E Oh okay.

C So.  
C I think it was the school bus that we have downstairs.  
E Oh okay.  
E I see, that's a good question.  
C Thanks.  
C What's your favorite subject in school [FQ] [SQ] [RQ] [RD]?  
E Um, probably English, because I like to read.  
C Yeah.  
E Yeah.  
E Probably my favorite.  
E That was a good question too.  
E Can you think of anything else that you'd like to know about me?  
E If you can't that's okay.  
C No, I can't.  
E That's okay.  
E Well thanks for taking the time to interview with me.  
C Thanks.  
E I learned a lot about you.  
C Yeah, thanks.