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The underlying basis of the communication difficulties of high functioning pervasive developmental disorder

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APPENDIX B

DESCRIPTION OF PROCEDURES AND SCORING FOR VARIOUS OF THE ASSESSMENT MEASURES

APPENDIX B1: PROCEDURE AND SCORING FOR THE PRONOUN ALTERNATION TASK

The pronoun alternation task consisted of an adaptation of Tanz's (1980) procedure to test pronoun alternation in children. In Tanz's (1980) first study, subjects were below the age of 5.1 years (3.6 to 5.1 years) and in the second study they were below the age of 5.3 years (2.7 to 5.3 years). Results suggested that the majority of these children, who were children with normal language development, coped well on these tasks.

The format used in the current study was to request the child to ask a puppet particular questions. This differed from Tanz's (1980) study where a person rather than a puppet was used. As in Tanz's (1980) study, the questions involved pronominal reference to one or more of the three participants in the interchange. In the current study, while the researcher was telling the child what he/she needed to ask the puppet, the puppet was placed in a material bag and told that it could not hear or see what was happening while in the bag. This was carried out to prevent the task from being redundant for the child and more pragmatically appropriate, i.e. there needed to be a reason for the child to ask the puppet the question.

In addition to pronoun shifting items, Tanz (1980) included three items where the child had to shift from a proper noun to a pronoun. As the present study was interested primarily in pronoun shift, these items were not included in the present study. An outline of the procedure and test items is found below.

Procedure: The researcher said to the child: "This is my friend Roger. When he is in his bag, he can't hear us and he can't see us. I will put him in the bag and then tell you what you must ask him". The researcher then placed Roger, the puppet, in the bag and presented the first item. When Roger was taken out the bag, the child was required to ask Roger (the puppet) the question.

Items:

1) Ask Roger what his favourite colour is.
Example of correct response: Roger, what is your favourite colour?

2) Ask Roger if I have blue eyes.
Example of correct response: Roger, does she (or person's name) have blue eyes?

3) Ask Roger to guess what your favourite colour is.
Example of correct response: Roger, guess what my favourite colour is?

4) Ask Roger where he lives.
Example of correct response: Roger, where do you live?

5) Ask Roger where my bicycle is.
Example of correct response: Roger, where is her (or person's name) bicycle?

6) Ask Roger if you have been good.
Example of correct response: Roger, have I been good?

7) Ask Roger if you can visit him.
Example of correct response: Roger, can I visit you?

8) Ask Roger to guess what your middle name is?
Example of correct response: Roger, guess what my middle name is?

9) Ask Roger what I found yesterday.
Example of correct response: Roger, what did she (or person's name) find yesterday?

10) Ask Roger if he is scared of me.
Example of correct response: Roger, are you scared of her (or person's name)?

11) Ask Roger where you should put this?
Example of correct response: Roger, where should I put this?

12) Ask Roger to guess what my favourite colour is?
Example of correct response: Roger, guess what her (or person's name) favourite colour is?

13) Ask Roger if he is tired?
Example of correct response: Roger, are you tired?

14) Ask Roger if I should give you a surprise (at the end)?
Example of correct response: Roger, should she (or person's name) give me a surprise (at the end)?

Scoring: In the present study only pronoun shift was scored and not grammar or question formation, as pronoun shift was the primary interest in this task. Following Tanz (1980), even when the child supplied an answer rather than asked a question, the response could usually still be scored for pronoun shift. Each item was scored as correct or incorrect based on the pronoun shift only. For example, if for item 1 the child said "Your favourite colour is what?", he/she would still score a point, as even though the question formation was not correct, the pronoun alternation was.

Incorrect pronouns that were in the same category, i.e. in the category of first person pronouns or second person pronouns or third person pronouns, were still scored as correct as long as it was still clear who the child was referring to. Using "I" instead of "me", "you" instead of "your" and "she" instead of "her" were, therefore, all still scored as correct. For example, if for item 6 the child said "Me been good?" instead of "Have I been good?" this would still be scored as correct, as the child had correctly altered the pronoun from the second person ("you") to the first person pronoun ("me"). However, a confusion between "he" and "she" would not be acceptable as it would be unclear as to whom the child was referring. For example, if the child said "Does he have blue eyes?" for "Does she have blue eyes?" this would be scored as incorrect.

For each item, up to one self-correction or the re-administration of the item (with the therapist asking the question again, if the child required this) was permitted. This re-administration of an item was allowed as the primary focus was the pronoun alternation and not the child's ability to hold the question in memory.

Items 7, 10 and 14 involved the alternation of two pronouns each. These items were, therefore, allocated a score of 2 each, with each pronoun within these items being allocated a score of 1. All other items were allocated a score of 1. This task was, therefore, scored out of a total score of 17.

APPENDIX B2: SCORING SHEET FOR GRAMMATICAL ANALYSIS

SUBJECT: _____

<table>
<tr><td colspan="2">Minor utterances:</td></tr>
<tr><td colspan="2">Major utterances:</td></tr>
<tr><td colspan="2">Phrasal utterances:</td></tr>
<tr><td rowspan="2">T-units:</td><td>Independent clauses:</td></tr>
<tr><td>Dependent clauses:</td></tr>
<tr><td>Coord 1

Subord A1

Subord O

Subord S

Postmod clause 1</td><td>Coord 1+

Subord A 1+

Subord C

Postmod clause 1+</td></tr>
<tr><td colspan="2">Morphemes per T-unit:</td></tr>
</table>

APPENDIX B3: NARRATIVE ANALYSIS

APPENDIX B3.1: PROCEDURE FOR ELICITATION OF NARRATIVE

This procedure was based on that used by Tager-Flusberg and Sullivan (1995). It elicited a narrative employing the same children's book as that used by Tager-Flusberg and Sullivan (1995). As in Tager-Flusberg and Sullivan's (1995) study, in the present investigation the researcher went through the book with the child once without discussing the pictures. However, unlike in Tager-Flusberg and Sullivan's (1995) study, the researcher then went through the book a second time with the child and this time asked him/her to relate the story. In Tager-Flusberg and Sullivan's (1995) study the child told the story to a second experimenter. This could not be done in the current study for logistical reasons.

The following instructions were given to the child: "'This is a book about a boy and his pets: a frog, a dog, and a turtle. I'll show you the story one page at a time, so you can see how the story goes. After I've shown you the book, we'll go through it again' (Tager-Flusberg & Sullivan, 1995, p. 246) and I want you to tell me the story".

The researcher went through the book with the child. The book was paged through slowly so that the child could see the characters, get an idea of the story line and get an idea of the sequence of events and ending. The researcher did not say anything to the child during this time. The researcher then went back to the beginning of the book and asked the child to tell the story. The researcher again turned the pages for the child, encouraging the child to tell the story page by page. If the child needed prompts, limited prompts (such as "What is happening here?") were given (based on Tager-Flusberg & Sullivan, 1995).

After the child had related the story, the researcher went back to the four pages that had been chosen to depict high points of various episodes in the story. For each of these four pictures the child was asked to label and explain the emotional state of each of the characters, for example "How does ____ feel?" and "Why does _____ feel that way?". These questions follow those used in Tager-Flusberg and Sullivan's (1995) study. However, in Tager-Flusberg and Sullivan's (1995) study only two pictures depicting the high points of two story episodes were used, while in the current study four pictures were used.

APPENDIX B3.2: NARRATIVE ANALYSIS: HANDOUT TO RATERS

This analysis consists of both a coherence analysis and a clarity analysis. The coherence analysis is based on "The Coherence Analysis of Narratives" devised by Sinoff (1993). The clarity analysis is similar to that used by Ulatowska et al. (1983) and Henshilwood and Ogilvy (1999).

You will be rating a number of oral stories produced by children with high functioning pervasive developmental disorder, language-impairment and children with no history of developmental difficulties. The children's stories were audio taped, transcribed and typed out and will be presented in this format to you. Please use the following as a guide.

The narrative analysis looks at five parameters evaluating the coherence of the narrative and one parameter that looks at the clarity of the narrative. A description of these two analyses is found below:

COHERENCE ANALYSIS OF NARRATIVE

(Taken from Sinoff, 1993)

This analysis looks at the child's ability to convey a coherent, interrelated and well-organised story, with a clear beginning, middle and end. It differs from a linguistic analysis in that it is not conducted on a sentence by sentence basis, but consists of a qualitative, subjective judgement of the whole story (Sinoff, 1993).

This analysis consists of 5 parameters, with each parameter being rated on a 5-point scale, ranging from very-poor to very-good. A rating of very-poor should also be given when that parameter is not observed. Intermediate points between very-poor and very-good are used for varying degrees of attainment of that parameter (Sinoff, 1993).

The emphasis of this analysis is on the child's ability to communicate the story to his/her listener and the story should be viewed as a whole. The focus should not be on the grammatical correctness of the story, but rather on the level of achievement of each parameter based on the child's ability to communicate the story to his/her listener (Sinoff, 1993).

According to Sinoff (1993) the judging process must approximate a natural listener/reader response. Each story should not be re-read more than three to five times (aim for three) in order to prevent an over-analytical approach. [4]

The following points as outlined by Sinoff (1993) should be followed:

- View each parameter separately.
- Rate every parameter.
- The full range of the scale must be used, where necessary use the end points of the scale.
- The rating of each story should be completed before proceeding to the next one.

[4] In Sinoff's (1993) study it was suggested that each story not be read more than three times. However, in the current study a maximum of five times was suggested.

Explanation of parameters

The following should be used as a guide in rating the stories:

1) Temporal organisation

Definition

"The logical, sequential as opposed to arbitary presentation of the sequence of events which recount a story" (Sinoff, 1993, p. 268).

Guidelines showing effective use (Sinoff, 1993)

- The story forms a meaningful unit, relates the sequence of events telling 'what happened' and has a clear beginning, middle and end.
- The order of events is reflected in time, i.e. they are linked to a time frame.
- Every event is dependent on the previous event for its interpretation.
- A causal relationship between events may exist.

2) Relevance

Definition

"The appropriateness and relationship of description and events to the story as a whole" (Sinoff, 1993, p. 269).

Guidelines showing effective use (Sinoff, 1993)

- The story makes sense.
- All units of meaning or propositions add to the story line.
- All descriptions are related to the overall story, with there being no digression or ambiguity.

3) Development of character(s)

Definition

"Evidence of one or more characters as the centre of the story, and the elaboration of aspects of the characters (first or third person)" (Sinoff, 1993, p. 269).

Guidelines showing effective use (Sinoff, 1993)

- Either one or more characters form a central part of the story.
- The characters are extended in terms of their reactions, thoughts, feelings/emotions and attitude. These extensions contribute to the effectiveness and overall meaning of the story.

4) Supporting description

Definition

"The presentation of setting, such as where and under what circumstances the events and actions take place" (Sinoff, 1993, p. 269).

Guidelines showing effective use (Sinoff, 1993)

- The time, location, concurrent events, etc. which orientate the reader and enhance the story are described.

- Supporting descriptions can occur throughout the story and do not necessarily have to occur at the beginning of the story. These may often occur at the beginning of each episode.

5) Ending

Definition

"Specification of the outcome or resolution of 'what happened'" (Sinoff, 1993, p. 269).

Guidelines showing effective use (Sinoff, 1993)

- A logical consequence to the story is provided.
- The ending relates to the overall theme of the story and not just to the events that immediately precede it.

CLARITY ANALYSIS OF NARRATIVE

(After Ulatowska et al. (1983) and Henshilwood and Ogilvy (1999))

The clarity analysis consists of only one item. This is to be rated on a five-point scale in response to the question "How comprehensible is the language of the story?" (taken from Ulatowska et al., 1983). Ulatowska et al. (1983) and Henshilwood and Ogilvy (1999) found this to be a useful overall measure of clarity. Clarity ratings using this question have been found to be positively related to measures of the complexity of language (Ulatowska et al., 1983). This was felt to be a rough measure of cohesion (Ulatowska et al., 1983).

Guidelines showing effective use

- The language of the story is comprehensible (Ulatowska et al., 1983).
- It is clear to whom or to what the child is referring throughout the story, i.e. the referent is recoverable from elsewhere in the text (Prutting & Kirchner, 1987).
- Conjunctions are used that show a logical relation between clauses (Prutting & Kirshner, 1987).
- There is recognisable unity or connectedness of the story (Henshilwood & Ogilvy, 1999).
- The language used is complex enough to support the underlying meaning (Henshilwood & Ogilvy, 1999).

APPENDIX B3.3: NARRATIVE: ANALYSIS: SCORING SHEET

SUBJECT:

RATER:

DATE:

COHERENCE ANALYSIS

(Taken from Sinoff, 1993)

1) Temporal organisation

Very Poor	Poor	Fair	Good	Very Good

2) Relevance

Very Poor	Poor	Fair	Good	Very Good

3) Development of character(s)

Very Poor	Poor	Fair	Good	Very Good

4) Supporting description

Very Poor	Poor	Fair	Good	Very Good

5) Ending

Very Poor	Poor	Fair	Good	Very Good

CLARITY ANALYSIS

(After Henshilwood and Ogilvy (1999) and Ulatowska et al., 1983))

"How comprehensible is the language of the story?"

Very Poor	Poor	Fair	Good	Very Good

COMMENTS

APPENDIX B4: PRAGMATIC ANALYSIS

APPENDIX B4.1: DESCRIPTION OF PRAGMATIC ANALYSIS

(After Adams and Bishop, 1989; Bishop and Adams (1989); Penn (1983, 1988); Prutting and Kirchner (1983, 1987); Sonnenberg (1995))

The following is a description of the pragmatic rating used. This is largely based on Prutting and Kirchner's (1983, 1987) scale, although additional aspects from Adams and Bishop's (1989), Bishop and Adams's (1989), Penn's (1983, 1988) and Sonnenberg's (1995) pragmatic analyses were also included.

I) COMPREHENSION

Comprehension was not included in Prutting and Kirchner's (1983, 1987) scale. This was, however, added to the scale used in the current study as Bishop and Adams (1989) found the analysis of comprehension during conversation to be a useful measure of pragmatic ability. Furthermore, during the preliminary investigations of the current study, an analysis of comprehension during conversation using Bishop and Adams's (1989) judgement of inappropriacy analysis, was found to provide valuable information. Based on Bishop and Adams's (1989) analysis, the comprehension of literal meaning and the ability to use context in comprehension were included.

1) Comprehension of literal meaning – This looks at the child's ability to comprehend the literal meaning of a message (Bishop & Adams, 1989).

- **Appropriate:** Responses where the child has understood what was said on a literal level.
- **Inappropriate:** Responses where the child gives a response that is not appropriate to the question but to a related question; the child not fully grasping the meaning of a particular lexical item or function word in a question; and/or the child's response indicating that he/she has not fully understood what has been said (Bishop & Adams, 1989).

2) Ability to use context in comprehension – This looks at the child's ability to take the context into account in interpreting the message (Bishop & Adams, 1989).

- **Appropriate:** Responses that indicate that the child has taken the context into account in the interpretation of the message.
- **Inappropriate:** Difficulty in this area may result in the child showing adequate understanding of the literal meaning of an utterance, but missing his/her conversational partner's intended meaning. This may occur due to the child not taking the linguistic, environmental or social context of the utterance into account. This could result in over-literal interpretation of the message (Bishop & Adams, 1989).

II) VERBAL ASPECTS

SPEECH ACTS

3) Speech acts – The present rating combined Prutting and Kirchner's (1983, 1987) two categories of speech act pair analysis and variety of speech acts into one category. Speech acts refer to how an utterance is used in a communicative exchange, i.e. the function of the utterance or the meaning beyond the actual words (Rae Smith & Leinonen, 1992). This looks at the child's ability to adopt both speaker and listener roles that are appropriate to the context (Prutting & Kirchner, 1987). It evaluates whether the child is able to respond appropriately to his/her communication partner's

speech acts and appropriately initiate new speech acts. This also examines the variety of speech acts that the child uses, i.e. what he/she can do with his/her language, for example, direct, query, comment, assert, request, promise, acknowledge, respond to directives, respond to queries and respond to requests (Prutting & Kirchner, 1983, 1987).

- **Appropriate:** The child uses speech acts appropriately and employs a wide range of different speech acts. The speech acts that the child uses are appropriate to the context of what his/her conversational partner has said or done. Appropriate behaviour can be both verbal and non-verbal (for example, acting appropriately to a directive or request) (Prutting & Kitchner, 1987).
- **Inappropriate:** The child does not use speech acts appropriately or employs a reduced range of speech acts, for example a child commenting on everything or engaging in inappropriate questioning. The speech acts that the child uses are not appropriate to the context of what his/her conversational partner has said or done (Prutting & Kirchner, 1987).

TOPIC SKILLS

Prutting and Kirchner (1983, 1987) divided topic skills into selection, introduction, maintenance and shift/change. In the present study topic introduction, maintenance and shift/change were combined into one parameter to be rated, as they were felt to be so closely related. In addition, an additional parameter was added, that of coherence. Sonnenberg (1995) found this to be a useful measure of verbal pragmatic skills.

4) Selection – This investigates the child's ability to select topics appropriate to the context of the interaction (Prutting & Kirchner, 1987).

- **Appropriate:** The child appropriately selects topics for discussion, taking the context and participants into account (Prutting & Kirchner, 1987).
- **Inappropriate:** The child overuses certain topics, perseverates on certain topics, has a restricted range of topics or interests, introduces topics that would not appear to be of interest to his/her communication partner and/or selects inappropriate topics for discussion without taking the context and participants into account (Prutting & Kirchner, 1987).

5) Introduction, maintenance, change - This examines the child's ability to introduce a topic appropriately into the conversation, appropriately maintain a topic across the conversation and to change a topic appropriately in the conversation (Prutting & Kirchner, 1987).

- **Appropriate:** The child appropriately introduces a new topic for discussion, makes relevant contributions to a topic, makes smooth changes in topic and does this at appropriate times in the conversation and appropriately ends the discussion of a topic, doing this at a suitable place in the conversation (Prutting & Kirchner, 1987).
- **Inappropriate:** The child introduces too many topics within a certain period of time, experiences difficulty initiating new topics of discussion, experiences difficulty making relevant contributions to a topic, experiences difficulty maintaining a topic or stays too long on one topic (Prutting & Kirchner, 1987).

6) Coherence - Coherence refers to the "well-formedness" of the message, in terms of the plausibility, conventionality and conclusiveness of the message (Ulatowska et al., 1981). It refers to how interrelated the ideas presented are beneath the surface of the message (Sonnenberg, 1995). It is concerned with the ability to organise the

information appropriately and to complete ideas appropriately that are presented so that they make sense (Rae Smith & Leinonen, 1992).

- **Appropriate:** The child's ideas are well-formed, interrelated, appropriately sequenced and accurate/plausible. The reasoning behind the message appears appropriate and the message appears logical and conclusive.
- **Inappropriate:** The child's ideas are not adequately formed and are poorly related. Information is inappropriately sequenced and organised. Free association of ideas may occur and the information may not seem accurate or plausible. The reasoning underlying the message may not seem appropriate or logical and may seem idiosyncratic. The information provided may not seem conclusive.

TURN TAKING

Prutting and Kirchner (1987) examined turn taking in terms of initiation, response, repair/revision, pause time, interruption/overlap, feedback to listener, adjacency and contingency. The parameters of initiation, response, feedback to listener, adjacency and contingency were all combined to form one parameter called exchange structure (after Adams & Bishop, 1989). Furthermore, pause time and interruption/overlap were combined to form one parameter. Repair/revision and quantity/conciseness were rated as separate parameters.

7) Exchange structure – This is concerned with the smooth interchange between the speaker and the listener (Prutting & Kirchner, 1983, 1987). It investigates the child's ability to initiate a turn appropriately, respond to his/her conversational partner (both verbally and non-verbally) and give feedback to his/her conversational partner in order to move the conversation forward. It is also concerned with adjacency and contingency. Adjacency means that utterances occur immediately after the conversational partner's utterance and contingency means that utterances are on topic with or add information to his/her conversational partner's preceding utterance (Prutting & Kirchner, 1987).

- **Appropriate:** The child is able to initiate conversation, respond to comments made by his/her conversational partner and provide feedback to his/her conversational partner. Furthermore, the child's utterances are adjacent and contingent on those of his/her conversational partner (Prutting & Kirchner, 1987).
- **Inappropriate:** The child does not initiate enough conversation and over-relies on his/her conversational partner to keep the conversation going, dominates turns, does not take his/her turn, does not adequately respond to his/her conversational partner and does not give adequate feedback to his/her conversational partner (Prutting & Kirchner, 1987).

8) Repair/revision - This is concerned with the child's ability to repair the interaction when a breakdown in conversation occurs, as well as the child's ability to ask his/her conversational partner to repair the interaction when something has not been understood or appears ambiguous (Prutting & Kirchner, 1987).

- **Appropriate:** The child revises or changes his/her message to assist his/her conversational partner in understanding what he/she means. The child asks for clarification when he/she does not understand part of his/her conversational partner's message (Prutting & Kirchner, 1987).
- **Inappropriate:** The child does not respond or responds inappropriately to requests for clarification by his/her conversational partner. The child does not ask or inadequately

asks his/her conversational partner to repair the interchange, when a misunderstanding or ambiguity has occurred (Prutting & Kirchner, 1987).

9) Pause time/interruption/overlap – This is concerned with the pause time between turns, between words, between sentences and in response to a question. It also looks at interruptions between the speaker and listener or two people talking at the same time (overlap) (Prutting & Kirchner, 1983, 1987).
- **Appropriate:** The child avoids interrupting his/her conversational partner and uses appropriate lengths of pauses in the conversation (Prutting & Kirchner, 1987).
- **Inappropriate:** The child uses long pauses in the conversation or pause times that are too short and that result in overlap or interruptions (Prutting & Kirchner, 1987).

10) Quantity/Conciseness - This looks at how relevant and informative the information that the child provides is. It is concerned with whether the child's contributions are relevant to the interaction and whether his/her contribution is as informative as is required but not too informative (Prutting & Kirchner, 1983, 1987).
- **Appropriate:** The child's comments are both relevant and informative.
- **Inappropriate:** The child provides either too much or too little information and/or provides irrelevant information.

LEXICAL SELECTION

11) Specificity/accuracy - This looks at the child's ability to use the most appropriate lexical item in the context (Prutting & Kirchner, 1987).
- **Appropriate:** The child uses specific and appropriate lexical items that clearly convey the message (Prutting & Kirchner, 1987).
- **Inappropriate:** The child overuses unspecified referents, uses inappropriate lexical items, uses lexical items that do not facilitate understanding and uses neologisms and/or jargon (Prutting & Kirchner, 1987).

12) Cohesion – This refers to cohesive devices that provide "well-formedness" or connectedness to the child's language (Prutting & Kirchner, 1987; Ulatowska et al., 1983). Concerned with the way sentences in discourse are linked (Penn, 1988), it refers to how clearly the language conveys the message and clarity has been suggested to be a rough measure of cohesion (Henshilwood & Ogilvy, 1999; Ulatowska et al., 1983). Cohesion is expressed both through vocabulary (lexical cohesion) and grammar (grammatical cohesion) (Halliday & Hasan, 1976). It involves two aspects: the cohesive devices are appropriate and make sense; and the language is complex enough to support and connect the underlying message (Henshilwood & Ogilvy, 1999).
- **Appropriate:** The child conveys the message in a related and unified way (Prutting & Kirchner, 1987). The text is well connected and the information needed for interpretation is found elsewhere in the text (Prutting & Kirchner, 1983). Ideas are expressed in a logical and sequential way (Prutting & Kirchner, 1983) and there is an absence of ambiguity. Conjunctions are used to link clauses in a logical manner (Prutting & Kirchner, 1983).
- **Inappropriate:** Misinterpretations and ambiguity occur (Prutting & Kirchner, 1987). The conversation is disjointed and the information needed for interpretation of a referent is not provided (Prutting & Kirchner, 1987). The child uses conjunctions that do not show a logical connection between clauses (Prutting & Kirchner, 1987).

STYLISTIC VARIATIONS

13) Communicative sensitivity - This looks at adaptations that the child makes based on the context and social needs of the situation (Penn, 1988; Prutting & Kirchner, 1987). It includes: polite forms, changes in vocal quality, reference to his/her communication partner and the use of different syntax (Prutting & Kirchner, 1983).

- **Appropriate:** The child is able to adjust his speech style appropriately to his/her communicative partner and the context of the situation (Prutting & Kirchner, 1987).
- **Inappropriate:** The child is unable to adjust his speech style appropriately to his/her communicative partner and/or the context of the situation (Prutting & Kirchner, 1987).

III) PARALINGUISTIC ASPECTS (INTELLIGIBILITY AND PROSODICS)

Prutting and Kirchner (1987) included the following parameters under paralinguistic factors: intelligibility, vocal intensity, vocal quality, prosody and fluency. In the present study vocal intensity and vocal quality were combined into one parameter and an additional parameter - speech rate - was added.

14) Prosody - This refers to the intonation and stress patterns used, including variations in loudness, pitch and duration (Prutting & Kirchner, 1987).

- **Appropriate:** Appropriate use of intonation and stress patterns (Prutting & Kirchner, 1987).
- **Inappropriate:** Inappropriate use of intonation and stress patterns (Prutting & Kirchner, 1987). Speech may take on a sing-song quality, a monotonous quality or the quality of an accent.

15) Voice - This refers to the intensity, quality and pitch of the voice and whether the voice used appropriately conveys the intended meaning.

- **Appropriate:** The child uses speech that is not too loud or too soft for the communicative interchange, that is not too high or too low in pitch and that is conveyed with an appropriate vocal quality (Prutting & Kirchner, 1987).
- **Inappropriate:** The child uses speech that may be too loud or too soft for the communicative interchange, that may be too high or too low in pitch and a vocal quality that is inappropriate for the age and gender of the child (Prutting & Kirchner, 1987).

16) Speech rate – This refers to the speed at which the message is conveyed (Sonnenberg, 1995).

- **Appropriate:** The child uses speech that is not too fast or too slow.
- **Inappropriate**: The child uses speech that is either too fast or too slow.

17) Fluency – This refers to the ease of flow or smoothness of the message (Sonnenberg, 1995).

- **Appropriate:** The child uses speech that is smooth, flowing and fluent.
- **Inappropriate:** Non-fluencies that are present in the child's speech interfere with how the message is conveyed.

18) Intelligibility - This refers to how easily the message is understood and the clarity of the child's speech (Prutting & Kirchner, 1987).

- **Appropriate:** The child's speech is clear and can be easily understood.

- **Inappropriate:** The child's speech is unclear and cannot always be easily understood (Prutting & Kirchner, 1987).

IV) NON-VERBAL ASPECTS (KINESICS)

Prutting and Kirchner (1987) included the following parameters under non-verbal aspects: physical proximity, physical contacts, body posture, foot/leg and hand/arm movements, gestures, facial expression and eye gaze. In the present study physical proximity and body posture were combined into one parameter. Physical contacts, foot/leg and hand/arm movements and gestures were all combined into one parameter - body movements. Eye gaze was referred to as eye contact; and facial expression was kept as a parameter on its own.

19) Body posture and physical proximity - This consists of the posture the child adopts, such as leaning forward, slouching or reclining in his/her chair; as well as the distance that he/she sits or stands from his/her conversational partner (Prutting & Kirchner, 1987).

20) Eye contact - This refers to whether or not the gaze behaviour of the child is appropriate, for example, when the child is not looking at his/her communication partner is he/she looking at something else that is appropriate (e.g. a picture under discussion) or looking away appropriately (e.g. adopting a thinking posture).

21) Facial expression - This includes lip movements, eye movements, etc.

22) Body movements – This refers to physical contacts between the child and his/her conversational partner; foot/leg and hand/arm movements (e.g. touching or moving an object or touching part of one's body or clothing); and gestures, i.e. body movements that support, complement or replace the verbal message (Prutting & Kirchner, 1997).

- **Appropriate non-verbal behaviours:** The child uses non-verbal behaviours to add to the interpersonal or social aspects of communication. They add to the content of the message and assist in supporting and regulating the interchange (Prutting & Kirchner, 1987).
- **Inappropriate non-verbal behaviours:** The child uses non-verbal behaviours that do not support or assist in regulating the interchange, that do not add to the content of the message and/or which interfere with the interpersonal or social aspects of communication (Prutting & Kirchner, 1987).

These behaviours were rated on a five-point scale ranging from inappropriate to appropriate following that of Penn (1983, 1988) and Sonnenberg (1995).

APPENDIX B4.2: PRAGMATIC ANALYSIS: HANDOUT TO RATERS

(After Adams and Bishop, 1989; Bishop and Adams (1989); Penn (1983, 1988); Prutting and Kirchner (1983, 1987); Sonnenberg (1995))

You will be shown on video each child interacting with the researcher for fifteen minutes. Based on this interaction each of the following parameters must be rated on the pragmatic rating form according to a five-point scale, ranging from inappropriate to appropriate.

I) COMPREHENSION (UNDERSTANDING CONVERSATION)

1) Comprehension of literal meaning – This looks at the child's ability to comprehend the literal meaning of a message (Bishop & Adams, 1989).

- **Appropriate:** Responses that indicate that the child has understood what was said on a literal level.
- **Inappropriate:** Responses where the child gives a response that is not appropriate to the question but to a related question; the child not fully grasping the meaning of a particular lexical item or function word in a question; and/or the response indicating that he/she has not fully understood what has been said (Bishop & Adams, 1989).

2) Ability to use context in comprehension – This looks at the child's ability to take the context into account in interpreting the message (Bishop & Adams, 1989).

- **Appropriate:** Responses that indicate that the child has taken the context into account in the interpretation of the message.
- **Inappropriate:** Difficulty in this area may result in the child showing adequate understanding of the literal meaning of an utterance, but missing his/her conversational partner's intended meaning. This may occur due to the child not taking the linguistic, environmental or social context of the utterance into account. This could result in over-literal interpretation of the message (Bishop & Adams, 1989).

II) VERBAL ASPECTS

SPEECH ACTS

3) Speech acts – Speech acts refer to how an utterance is used in a communicative exchange, i.e. the function of the utterance or the meaning beyond the actual words (Rae Smith & Leinonen, 1992). This looks at the child's ability to adopt both speaker and listener roles that are appropriate to the context (Prutting & Kirchner, 1987). It evaluates whether the child is able to respond appropriately to his/her communication partner's speech acts and appropriately initiate new speech acts. It also looks at the variety of speech acts that the child uses, i.e. what he/she can do with his/her language, for example, direct, query, comment, assert, request, promise, acknowledge, respond to directives, respond to queries and respond to requests (Prutting & Kirchner, 1983, 1987).

- **Appropriate:** The child uses speech acts appropriately and uses a wide range of different speech acts. The speech acts are appropriate to the context of what his/her conversational partner has said or done. Appropriate behaviour can be both verbal and non-verbal (for example, acting appropriately to a directive or request) (Prutting & Kitchner, 1987).
- **Inappropriate:** The child does not use speech acts appropriately or uses a reduced range of speech acts, for example, a child comments on everything or engages in inappropriate questioning. The speech acts are not appropriate to the context of what his/her conversational partner has said or done (Prutting & Kirchner, 1987).

TOPIC SKILLS

4) Selection – This looks at the child's ability to select topics appropriate to the context of the interaction (Prutting & Kirchner, 1987).

- **Appropriate:** The child appropriately selects topics for discussion, taking the context and participants into account (Prutting & Kirchner, 1987).
- **Inappropriate:** The child overuses certain topics, perseverates on certain topics, has a restricted range of topics or interests, introduces topics that would not appear to be of interest to his/her communication partner and/or selects inappropriate topics for discussion without taking the context and participants into account (Prutting & Kirchner, 1987).

5) Introduction, maintenance, change - This looks at the child's ability to introduce a topic appropriately into the conversation, appropriately maintain a topic across the conversation and appropriately change a topic in the conversation (Prutting & Kirchner, 1987).

- **Appropriate:** The child appropriately introduces a new topic for discussion, makes relevant contributions to a topic, makes smooth changes in a topic and does this at appropriate times in the conversation and appropriately ends the discussion of a topic at an appropriate place in the conversation (Prutting & Kirchner, 1987).
- **Inappropriate:** The child introduces too many topics within a certain period of time, experiences difficulty initiating new topics of discussion, experiences difficulty making relevant contributions to a topic, experiences difficulty maintaining a topic or stays too long on one topic (Prutting & Kirchner, 1987).

6) Coherence - Coherence refers to the "well-formedness" of the message, in terms of the plausibility, conventionality and conclusiveness of the message (Ulatowska et al., 1981). It refers to how interrelated the ideas presented are beneath the surface of the message (Sonnenberg, 1995). It is concerned with the ability to organise the information appropriately and to complete ideas adequately that are presented so that they make sense (Rae Smith & Leinonen, 1992).

- **Appropriate:** The child's ideas are well-formed, interrelated, appropriately sequenced and accurate/plausible. The reasoning behind the message appears appropriate and the message appears logical and conclusive.
- **Inappropriate:** The child's ideas are not adequately formed and are poorly related. Information is inappropriately sequenced and organised. Free association of ideas may occur and the information may not seem accurate or plausible. The reasoning underlying the message may not seem appropriate or logical and may seem idiosyncratic. The information provided may not seem conclusive.

TURN TAKING

7) Exchange structure – This is concerned with the smooth interchange between the speaker and the listener (Prutting & Kirchner, 1983, 1987). It looks at the child's ability to appropriately initiate a turn, respond to his/her conversational partner (both verbally and non-verbally) and give feedback to his/her conversational partner in order to move the conversation forward. It is also concerned with adjacency and contingency. Adjacency means that utterances occur immediately after the conversational partner's utterance and contingency means that utterances are on topic

with or add information to his/her conversational partner's preceding utterance (Prutting & Kirchner, 1987).

- **Appropriate:** The child is able to initiate conversation, respond to comments made by his/her conversational partner and provide feedback to his/her conversational partner. Furthermore, the child's utterances are adjacent and contingent on his/her conversational partner's utterances (Prutting & Kirchner, 1987).
- **Inappropriate:** The child does not initiate enough conversation and over-relies on his/her conversational partner to keep the conversation going, dominates turns, does not take his/her turn, does not adequately respond to his/her partner and does not give adequate feedback (Prutting & Kirchner, 1987).

8) Repair/revision - This is concerned with the child's ability to repair the interaction when a breakdown in conversation occurs, as well as the child's ability to ask his/her conversational partner to repair the interaction when something has not been understood or appears ambiguous (Prutting & Kirchner, 1987).

- **Appropriate:** The child revises or changes his/her message to assist his/her conversational partner understanding what he/she means. The child asks for clarification when he/she does not understand part of his/her conversational partner's message (Prutting & Kirchner, 1987).
- **Inappropriate:** The child does not respond or responds inappropriately to requests for clarification by his/her conversational partner. The child does not ask or inadequately asks his/her conversational partner to repair the interchange, when a misunderstanding or ambiguity has occurred (Prutting & Kirchner, 1987).

9) Pause time/interruption/overlap – This is concerned with the pause time between turns, between words, between sentences and in response to a question. It also looks at interruptions between the speaker and listener or two people talking at the same time (overlap) (Prutting & Kirchner, 1983, 1987).

- **Appropriate:** The child avoids interrupting his/her conversational partner and uses appropriate lengths of pauses in the conversation (Prutting & Kirchner, 1987).
- **Inappropriate:** The child uses long pauses in the conversation or pause times that are too short and that result in overlap or interruptions (Prutting & Kirchner, 1987).

10) Quantity/Conciseness - This looks at how relevant and informative the information that the child provides is. It is concerned with whether the child's contributions are relevant to the interaction and whether his/her contribution is as informative as is required but not too informative (Prutting & Kirchner, 1983, 1987).

- **Appropriate:** The child's comments are both relevant and informative.
- **Inappropriate:** The child provides either too much or too little information and/or provides irrelevant information.

LEXICAL SELECTION

11) Specificity/accuracy - This looks at the child's ability to use the most appropriate lexical item in the context (Prutting & Kirchner, 1987).

- **Appropriate:** The child uses specific and appropriate lexical items that clearly convey the message (Prutting & Kirchner, 1987).
- **Inappropriate:** The child overuses unspecified referents, uses inappropriate lexical items, uses lexical items that do not facilitate understanding and uses neologisms and/or jargon (Prutting & Kirchner, 1987).

12) Cohesion – This refers to cohesive devices that provide "well-formedness" or connectedness to the child's language (Prutting & Kirchner, 1987; Ulatowska et al., 1983). Concerned with the way sentences in discourse are linked (Penn, 1988), it refers to how clearly the language conveys the message and clarity has been suggested to be a rough measure of cohesion (Henshilwood & Ogilvy, 1999; Ulatowska et al., 1983). Cohesion is expressed through both vocabulary (lexical cohesion) and grammar (grammatical cohesion) (Halliday & Hasan, 1976). It involves two aspects: the cohesive devices used are appropriate and make sense; and the language used is complex enough to support and connect the underlying message (Henshilwood & Ogilvy, 1999

- **Appropriate:** The child conveys the message in a related and unified way (Prutting & Kirchner, 1987). The text is well connected and the information needed for interpretation is found elsewhere in the text (Prutting & Kirchner, 1983). Ideas are expressed in a logical and sequential way (Prutting & Kirchner, 1983) and there is an absence of ambiguity. Conjunctions are used to link clauses in a logical manner (Prutting & Kirchner, 1983).
- **Inappropriate:** Misinterpretations and ambiguity occur (Prutting & Kirchner, 1987). The conversation is disjointed and the information needed for interpretation of a referent is not provided (Prutting & Kirchner, 1987). The child uses conjunctions that do not show a logical connection between clauses (Prutting & Kirchner, 1987).

STYLISTIC VARIATIONS

13) Communicative sensitivity - This looks at adaptations that the child makes based on the context and social needs of the situation (Penn, 1988; Prutting & Kirchner, 1987). It includes: polite forms, changes in vocal quality, reference to his/her communication partner and the use of different syntax (Prutting & Kirchner, 1983).

- **Appropriate:** The child is able to adjust his speech style appropriately to his/her communicative partner and the context of the situation (Prutting & Kirchner, 1987).
- **Inappropriate:** The child is unable to adjust his speech style appropriately to his/her communicative partner and/or the context of the situation (Prutting & Kirchner, 1987).

III) PARALINGUISTIC ASPECTS (INTELLIGIBILITY AND PROSODICS)

14) Prosody - This refers to the intonation and stress patterns used, including variations in loudness, pitch and duration (Prutting & Kirchner, 1987).

- **Appropriate:** Appropriate use of intonation and stress patterns (Prutting & Kirchner, 1987).
- **Inappropriate:** Inappropriate use of intonation and stress patterns (Prutting & Kirchner, 1987). Speech may take on a sing-song quality, a monotonous quality or the quality of an accent.

15) Voice - This refers to the intensity, quality and pitch of the voice and whether the voice used appropriately conveys the intended meaning.

- **Appropriate:** The child uses speech that is not too loud or too soft for the communicative interchange, that is not too high or too low in pitch and that is conveyed with an appropriate vocal quality (Prutting & Kirchner, 1987).
- **Inappropriate:** The child uses speech that may be too loud or too soft for the communicative interchange, that may be too high or too low in pitch and a vocal

quality that is inappropriate for the age and gender of the child (Prutting & Kirchner, 1987).

16) Speech rate – This refers to the speed at which the message is conveyed (Sonnenberg, 1995).
- **Appropriate:** The child uses speech that is not too fast or too slow.
- **Inappropriate**: The child uses speech that is either too fast or too slow.

17) Fluency – This refers to the ease of flow or smoothness of the message (Sonnenberg, 1995).
- **Appropriate:** The child uses speech that is smooth, flowing and fluent.
- **Inappropriate:** Non-fluencies that are present in the child's speech, interfere with how the message is conveyed.

18) Intelligibility - This refers to how easily the message is understood and the clarity of the child's speech (Prutting & Kirchner, 1987).
- **Appropriate:** The child's speech is clear and can be easily understood.
- **Inappropriate:** The child's speech is unclear and can not always be easily understood (Prutting & Kirchner, 1987).

IV) NON-VERBAL ASPECTS (KINESICS)

19) Body posture and physical proximity - This consists of the posture the child adopts, such as leaning forward, slouching or reclining in his/her chair; as well as the distance that he/she sits or stands from his/her conversational partner (Prutting & Kirchner, 1987).

20) Eye contact - This refers to whether or not the gaze behaviour of the child is appropriate, for example, when the child is not looking at his/her communication partner is he/she looking at something else that is appropriate (e.g. a picture under discussion) or looking away appropriately (e.g. adopting a thinking posture).

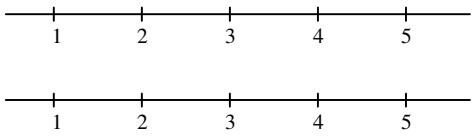
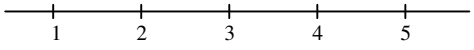
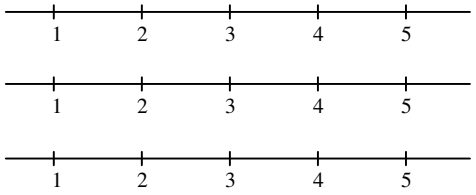
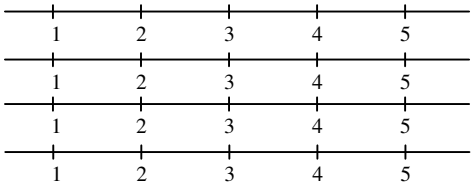
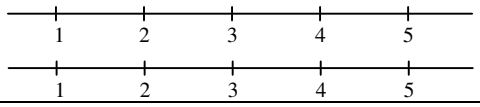
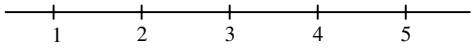
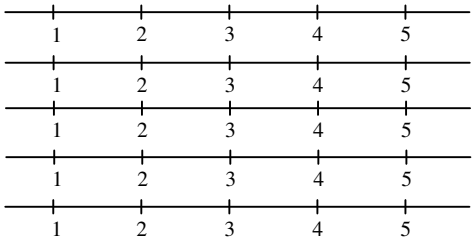
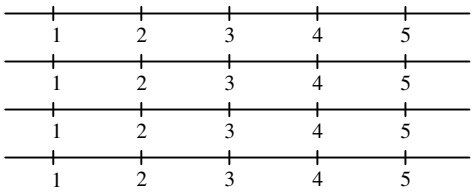
21) Facial expression - This includes lip movements, eye movements etc.

22) Body movements – This refers to physical contacts between the child and his/her conversational partner; foot/leg and hand/arm movements (e.g. touching or moving an object or touching part of one's body or clothing); and gestures, i.e. body movements that support, complement or replace the verbal message (Prutting & Kirchner, 1997).

- **Appropriate non-verbal behaviours:** The child uses non-verbal behaviours to add to the interpersonal or social aspects of communication. They add to the content of the message and assist in supporting and regulating the interchange (Prutting & Kirchner, 1987).

- **Inappropriate non-verbal behaviours:** The child uses non-verbal behaviours that do not support or assist in regulating the interchange, that do not add to the content of the message and/or interfere with the interpersonal or social aspects of communication (Prutting & Kirchner, 1987).

APPENDIX B4.3: PRAGMATIC RATING FORM

	BEHAVIOUR	Inappropriate Appropriate
Compr.	Comprehension 1) Comprehension of literal meaning 2) Use of context in comprehension	
Verbal	Speech acts 3) Speech acts	
	Topic skills 4) Selection 5) Introduction, maintenance, change 6) Coherence	
	Turn taking 7) Exchange structure 8) Repair/revision 9) Pause time/interruption/overlap 10) Quantity/conciseness	
	Lexical selection 11) Specificity/accuracy 12) Cohesion	
	Stylistic variations 13) Communicative sensitivity	
Paralinguistic	Intelligibility & prosodics 14) Prosody 15) Voice (intensity, quality, pitch) 16) Speech rate 17) Fluency 18) Intelligibility	
Non-verbal	Kinesics 19) Body posture 20) Eye contact 21) Facial expression 22) Body movements	

APPENDIX B5: VISUAL PERCEPTUAL ROLE TAKING TASK

Dawson and Fernald's (1987) perceptual role taking tasks were followed. These are described below. For all these tasks the researcher and the child were seated across from each other.

1) Upside down person

Procedure: Before starting this task the researcher came to the child's side of the table to check his/her understanding of 'upside down' or 'standing on his head'. The researcher then returned to sitting opposite the child. The researcher then placed a black and white line drawing of a boy standing up, crosswise between her and the child. The researcher then asked the child to show the boy to her so that the researcher could see the boy 'standing on his head' or 'upside down'. If the child did not place the picture in the correct orientation, he/she was told that it did not look correct and the task was carried out again (Dawson & Fernald, 1987).

Scoring: If the child carried out the task correctly on the initial attempt, he/she received two points. If he/she carried it out on the second trial he/she scored one point (Dawson & Fernald, 1987).
Total score: 2 points

2) Face

Procedure: The researcher placed a line drawing of a face crosswise between her and the child. The researcher asked the child to make the boy look at the researcher. If the child responded incorrectly, he/she was told that it did not look correct and the task was carried out again (Dawson & Fernald, 1987).

Scoring: If the child carried out the task correctly on the initial attempt, he/she received two points. If he/she carried it out correctly on the second trial he/she scored one point (Dawson & Fernald, 1987).
Total score: 2 points

3) Spontaneous

Procedure: In Dawson and Fernald's (1987) study three sets of two picture-cards were used. In the present study only one set of two picture-cards was used. The pictures consisted of children playing. Both pictures were presented together and placed the right way up for the child. The child was asked to choose a picture and show it to the researcher. If the picture was shown the right way up for the researcher, it was scored as correct. If the child responded incorrectly, he/she was told that it did not look correct and the task was carried out again.

Scoring: If the child carried out the task correctly on the initial attempt, he/she received two points. If he/she carried it out correctly on the second trial he/she scored one point (Dawson & Fernald, 1987).
Total score: 2 points

4) Cubes

Procedure: Two identical cubes, approximately six-inches by six-inches, were presented. On each of the vertical faces of each cube there was a different picture, these being a ball, a dog, a tree and a chair. Before the task started the researcher came around to the child's side of the table and went through the pictures on one of the cubes with the child, until the child appeared to have memorised the pictures and their relative positions on the cube. The researcher then returned to sitting opposite the child and the second cube was presented. The researcher turned the cube, presenting a different picture to the child on each of the four trials. For each of the pictures shown, the child was asked to turn his/her cube so that he/she was looking at the same thing on his/her cube that the researcher was looking at on her cube (Dawson & Fernald, 1987).

Scoring: For each correct response the child received one point, there being a total of four trials (Dawson & Fernald, 1987).
Total score: 4 points

5) Single cube

Procedure: Here only one cube was presented. The researcher randomly turned the single cube presenting a different picture to the child on each of the four trials. On each trial the child was asked to name the picture that he/she could see and then to name the picture that the experimenter could see (Dawson & Fernald, 1987).

Scoring: Only the naming of the pictures the experimenter could see were scored. The child received one point for each correct response (Dawson & Fernald, 1987).
Total score: 4 points

APPENDIX B6: UNDERSTANDING THE MENTAL SIGNIFICANCE OF THE EYES TASK

1) Understanding whether seeing leads to knowing

Baron-Cohen and Goodhart's (1994) experiment was followed, with some minor adaptations.

Procedure: The researcher first introduced two dolls to the child saying, "This is John. This is Fiona". The researcher then showed the child some boxes saying, "Look I've got some boxes here. There is something inside each box. I'm going to show the boxes to John and Fiona." (Baron-Cohen & Goodhart, 1994, p. 399). The experiment consisted of five trials. For each of the trials the researcher made one of the dolls pick up a closed box and the other doll open the lid and look inside. A different box was used for each trial. For each trial the researcher said to the child, "John/Fiona lifts the box up. Fiona/John opens the box and has a look" (Baron-Cohen & Goodhart, 1994, p. 399). After this the child was asked, "Who knows what's in the box? John or Fiona?" (Baron-Cohen & Goodhart, 1994, p. 399). The order that the two dolls were mentioned, the order of looking versus lifting, as well as the order that the doll's names were mentioned in the question, were randomised across the five trials. The child was prevented from seeing inside the box when the doll opened it (Baron-Cohen & Goodhart, 1994).

In the present study an additional question was added, this being "Why?" or "How do you know?" so that the child had to give a reason for a particular doll knowing what was in the box, i.e. that he/she had looked inside. This was done to prevent the child getting items correct based on chance alone and in this way the child's understanding of the reason was tapped.

Scoring: Unlike Baron-Cohen and Goodhart's (1994) study where a pass was obtained if the child scored correctly on all five trials, in the present study a score out of 5 was obtained. This was carried out in order to reflect the range of ability that children may have on this task. In order to score a point for each trial the child had to identify the correct doll as well as give a correct reason, for example "He looked", "He saw inside". The reason was scored according to the meaning conveyed and not the grammatical correctness of the sentence.

2) Eye pointing task

This was based on a combination of the experiments used by Baron-Cohen et al., (1995) and Lee et al. (1998). Both Baron-Cohen et al. (1995) and Lee et al. (1998) carried out these tasks with pre-schoolers. Baron-Cohen et al. (1995) tested 4 year olds and Lee et al. (1998) tested 3 to 6 year olds. Their results suggest that normal children as young as 3 and 4 years are able to use eye gaze information to complete tasks successfully such as those described below.

Procedure: Children were shown black and white drawings of a boy named Larry looking at one of six surrounding objects. Larry was placed in the centre of each page with the six objects placed around him, one object to the left of him, one to the right, one object in the top right corner, one in the bottom right corner, one in the top left corner and one in the bottom left corner. It was decided to use six objects, as used by

Lee et al., (1998) rather than four objects, as used by Baron-Cohen et al., (1995) in order to reduce the number of correct responses that could be produced by chance alone. For the first two conditions as well as the last condition (i.e. the desire, goal and eye direction condition), objects commonly desired by young children were used. The six objects used in each picture differed from those in all the other pictures. In the third condition (the refer condition) the objects consisted of nonsense shapes/objects. Each condition consisted of three items. For the three pictures in each condition Larry's eye gaze was directed at either the upper, middle or lower levels and was directed either to the right or to the left. The order of Larry's eye gaze direction (i.e. upper, middle or lower levels and whether to the right or the left) was randomised so that across the twelve items used all possible eye directions were included.

This task consisted of four conditions:

- *Desire condition:* The aim here was to see if the child could determine the character's desire based on the information provided by his eyes (Baron-Cohen et al., 1995). For each picture the child was asked, "What does Larry want?"
- *Goal condition:* The aim here was to determine the character's goal based on the information provided by his eyes (Baron-Cohen et al., 1995). For each picture the child was asked, "Which one is Larry going to take?"
- *Refer condition:* The aim here was to see if the child could determine the character's intention to refer based on the information provided by his eyes (Baron-Cohen et al., 1995). For each picture the child was asked, "Larry says 'There's the beb/don/sen'. Which one does Larry say is the beb/don/sen?"
- *Eye direction condition:* The aim here was to determine the child's ability to determine the direction of the character's eye gaze (Lee et al., 1998). For each picture the child was asked, "Where is Larry looking?"

Scoring: One point was given for each correct answer. This gave a possible total of 3 points for each condition and an overall possible total of 12 points.

3) Thought detection task

This task was similar to that used by Baron-Cohen et al. (1995), the main difference being that in Baron-Cohen et al.'s (1995) task sixteen photo pairs were used, while in the present study eight photo pairs were used. For the present study these photo pairs were prepared by taking photos of children either looking directly ahead at the camera or adopting a thinking posture, i.e. with the eyes looking to one side and in an upward position. As in Baron-Cohen et al.'s (1995) study the photos where the children were looking away and upwards were all judged by two independent raters as depicting thinking. In all the photos the expression of the mouth was neutral. The photos were black and white and were approximately nine centimetres by twelve centimetres.

Procedure: Photos were presented, one pair at a time. In each of the photo pairs, one of the photos depicted 'thinking'. The order of the 'thinking' photo, i.e. either the photo on the left versus the right was randomised across the eight items. For each photo pair presented, the child was asked, "Which one is thinking?".

Scoring: Unlike Baron-Cohen et al.'s (1995) study where a pass was obtained if the child scored a certain number of items correct, in the present study a score out of 8 was obtained. This was carried out in order to reflect the range of ability that children might have on this task. A score of 1 was given for each photo pair where the child correctly identified the 'thinking' photo.

APPENDIX B7: BELIEF TASKS

Measure of belief consisted of two first-order false belief tasks and one second-order false belief task.

1) First order false belief tasks

a) Unexpected identity task

Unexpected identity tasks similar to those used by Davis and Pratt (1995), Gordon and Olson (1998), Slaughter (1998), Symons et al. (1997) and Zelazo et al. (1996) were administered. In these tasks the initial identity of something appears different to what it really is. Once the child knows it's real identity they are asked what someone, who the real identity of the item has not yet been revealed to, may think it is. In order to respond correctly the child needs to think about what knowledge of the item the person has and not what his or her knowledge is. The procedure and scoring used is described below.

Procedure: Two deceptive items/tasks were used:

1) A smartie box containing buttons
2) An egg box containing golf balls

Each item was first presented to the child in its deceptive state. The child was then asked a belief-establishing question, "What do you think is in the box?" (Davis & Pratt, 1995). The child was then allowed to open the box and was asked a reality establishing question, "What is really in the box?" (Davis & Pratt, 1995). After the real state of the item was revealed, the item was returned to its deceptive state. A puppet ("Roger", the puppet also used in the pronoun alternation task) was then taken out. The smartie box in trial one and the egg box in trial two were then shown to Roger and the child was told: "Roger has been in his bag. When he is in his bag, he cannot hear us or see us. Now he has come out and is looking at the box". The child was then asked the four test questions (based on those used by Gordon and Olson (1998) and Zelazo et al. (1996)):

1) False belief question: "What will Roger think is in the box?"
2) Representational change question: "What did you think was in here before you opened it?"
3) Appearance question: "What does this box look like it has in it?"
4) Reality question: "What is really in the box?"

On Gordon and Olson's (1998) suggestion, if the child was unable to respond to any of these open-ended questions, he/she was given a forced alternative, e.g. "Does Roger think the box has buttons or smarties?"

Scoring: As in Gordon and Olson's (1998) experiment, the child was only given credit for his/her answers on the first three theory of mind questions if he/she answered the reality question for that task correctly (Gordon & Olson, 1998). In order to score a point the child was required to answer all three of the theory of mind questions correctly. A total score of 2 could, therefore, be obtained for this measure, as this task consisted of two trials.

b) Unexpected location task (The Sally-Ann experiment)

Unexpected location tasks (particularly the Sally-Ann experiment) have been used in a number of previous studies (Baron-Cohen et al., 1985; Charman & Campbell, 1997; Scott & Baron-Cohen, 1996; Peterson & Siegal, 1995, 1998). For the Sally-Ann experiment a similar procedure to that used by Baron-Cohen et al. (1985), Charman and Campbell (1997) and Scott and Baron-Cohen (1996) was followed. This is described below.

Procedure: Two dolls, Sally and Anne, were introduced to the child. The experimenter assisted the child in memorising the dolls' names and checked that the child knew which doll was which before the task began. A story was then acted out for the child: "Sally is playing. Her mother then calls her so she hides her marble in a basket and goes to help her mother. Anne is naughty and decides to play a trick on Sally. She moves the marble from the basket to a box. Sally then comes back". The child was then asked three questions, based on those used by Baron-Cohen et al. (1985), Charman and Campbell (1997) and Scott and Baron-Cohen (1996).

1) The critical belief question: "Where will Sally look for her marble first?"/ "Where does Sally think the marble is?"
2) The reality question: "Where is the marble really?"
3) The memory question: "Where was the marble at the beginning?"

The second and third questions are control questions and needed to be answered correctly before the child could be given credit for his/her answer on the belief question (Charman & Campbell, 1997; Scott & Baron-Cohen, 1996). The control questions were designed to check that key elements of the story had been understood (Charman & Campbell, 1997; Scott & Baron-Cohen, 1996). Two trials were administered with the hiding locations being varied each time.

Scoring: The scoring used by Charman and Campbell (1997) and Scott and Baron-Cohen (1996) was used. Here the child was scored as passing the trial if he/she answered the belief question correctly as well as both the control questions. A total score of 2 could, therefore, be obtained for this task, as this task consisted of two trials.

2) Second-order false belief tasks

The second order false belief experiments followed by Baron-Cohen (1989b) and Perner and Wimmer (1985) were followed. This consisted of the ice-cream story.

Procedure: The experiment followed was identical to that used by Baron-Cohen (1989b), except, instead of one of the locations in the experiment being a church, it was changed to the shops. This was done as children from a variety of religious backgrounds were included in the present study and it was, therefore, not felt appropriate to have a church as a location. The other change was that the word 'village' used in Baron-Cohen's (1989b) experiment was not used, as it was felt that not all the children in the study would be familiar with this word. Unlike the Baron-Cohen (1989b) experiment the ice-cream man used consisted of an ice-cream man pushing an ice-cream trolley rather than an ice-cream man in a van.

The only other change was that the toy village used was laid out on the floor and not on a table as in Baron-Cohen's (1989b) experiment. This was done due to the props used being so large and in order to bring variety into the testing procedure, i.e. many

tasks had already been conducted at the table. The experimenter sat next to the child on the floor to carry out this task. The village presented was described to the child and then he/she was asked to name the different locations presented. The researcher then acted out the following story, moving the dolls accordingly.

The following is a description of the experiment taken from Baron-Cohen (1989b). Any changes made are marked with italics and placed in single inverted commas. Wording which is identical to Baron-Cohen's (1989b) is included in double inverted commas.
"This is John and this is Mary". '*This is where they live'*.
"Naming question: Which is John/Mary?"
"Here they are in the park. Along comes the ice-cream man. John would like to buy an ice-cream but he has left his money at home. He is very sad. 'Don't worry says the ice-cream man, 'you can go home and get your money and buy some ice cream later. I'll be here in the park all afternoon …'. 'Oh good' says John, 'I'll be back in the afternoon to buy an ice-cream'".
"Prompt question (1): Where did the ice-cream man say to John he would be all afternoon?"
"So John goes home. He lives in this house. Now the ice-cream man says 'I am going" '*to the shops'* "to see if I can sell ice-creams outside there'".
"Prompt question (2): Where did the ice-cream man say he was going?"
"Prompt question (3): Did John hear that?"
"The ice-cream man" '*goes to the shops'*. "On his way he passes John's house. John sees him and says 'Where are you going?'. The ice-cream man says 'I'm going to sell some ice-cream outside the" '*shops'*. "So off he" '*walks'* "to the" '*shops'*.
"Prompt question (4): Where did the ice-cream man tell John he was going?"
"Prompt question (5): Does Mary know that the ice-cream man has talked to John?"
"Now Mary goes home. She lives in this house. Then she goes to John's house. She knocks on the door and says 'Is John in?'. "No," says his mother, 'he's gone out to buy an ice-cream'".
"Belief question: Where does Mary think John has gone to buy an ice-cream?"
"Justification question: Why?"
"Reality question: Where did John really go to buy his ice-cream?"
"Memory question: Where was the ice-cream man in the beginning?" (Baron-Cohen, 1989b, p. 290).
The experiment was then repeated, changing the locations, so that in the second trial the characters started outside the shops.

Some minor changes to the language outlined above were sometimes made during the actual acting out of the above story. If the child did not appear to be understanding the story, some parts were re-explained to the child with the researcher adjusting or simplifying her language accordingly.

Scoring: A combination of the scoring used by Baron-Cohen (1989b) and Perner and Wimmer (1985) was used. Scoring consisted of scoring the child's answers to the belief questions as well as to the justification questions.

Scoring of belief question – The child was required to pass the control questions, which included the naming, reality, memory and prompt questions, before he/she

could be given credit for the belief question, i.e. he/she had to pass the control questions as well as the belief question in order to be given credit for the belief question (Baron-Cohen, 1989b). As the test was conducted over two trials a total score of 2 could be obtained for the belief questions.

Scoring of justification questions – If the child passed the belief question for that trial then his/her response on the justification question for that trial could be scored. Children's answers to the justification questions were assigned to one of four categories, with scores ranging from 3 to 0 depending on the category that the child's answer fell into. The following categories were used:

1) **Second-order belief** – Here the child took account of both John and Mary's belief in his/her response (Baron-Cohen, 1989b). For example, "John thinks that Mary thinks that …". This category was used by Baron-Cohen (1989b) and appeared to be similar to Perner and Wimmer's (1985) category of belief-belief. If the child's answer fell within this category he/she was given a score of 3.
2) **First-order belief** – Here the child took account of John's or Mary's belief/s in his/her response (Baron-Cohen, 1989b). For example, "Mary does not know that …". This category was used by Baron-Cohen (1989b) and appeared to be similar to Perner and Wimmer's (1985) category of belief-information. If the child's answer fell within this category he/she was given a score of 2.
3) **Initial location** – Here the child's answer referred to the initial location of the ice-cream man (Perner & Wimmer, 1985). For example, "The ice-cream man was at the shops before/in the beginning", "The ice-cream man said he would be at the shops the whole afternoon". This category was used by Perner and Wimmer (1985) and not by Baron-Cohen (1989b). This category was included as a number of children indicated the initial location when they had not been able to express first-order or second-order beliefs in their answers. Their answers appeared to show an understanding of the changing belief of the character even though they were unable to fully express it and it was felt that they should receive credit for this. If the child's answer fell within this category he/she was given a score of 1.
4) **Zero** – Here the child did not refer to either John's or Mary's belief or the initial location in his/her answer.

As suggested by Baron-Cohen (1989b) a conservative scoring approach was used so that if it was uncertain whether a response fitted a category then the category below (i.e. one level down) was rather used. As the test was conducted over two trials a total score of 6 could be obtained for the justification questions.

APPENDIX B8: DECEPTION TASK

Sodian's (1991) king and robber deception task was carried out with some minor adaptations. This is described below.

Procedure: A king hand puppet and a robber hand puppet, two boxes and gold stars were used. The child was first introduced to the puppets. He/she was told that the king was a good king and that he liked to help children and that the robber was a bad robber and that he liked to tease children. The child was then told that they were going to play a hiding game where they could win gold stars. The puppets were placed in a bag and the child was told that when in the bag the puppets could not see or hear what was happening. The child was then asked to place a star in one of the boxes. Before one of the puppets was taken out of the bag the child was told, "If the king asks you where the star is and he finds it, he will give you another star and if the robber asks you where the star is and he finds it, he will take it away". The king puppet was then taken out of the bag and the king asked the child, "Where's the star?". When the child showed the king puppet, the puppet gave the child the star that had been hidden as well as another star, saying, "I am so glad I found the star. Because you showed me you can have this star and another star". The king was then put away and the child was given another star to hide. The robber puppet was then taken out of the bag and this puppet asked the child "Where's the star?". If the child showed the robber the star, then the robber took the star for himself. If the child showed the robber the incorrect location, the robber said "No star in here. I am going away" and he would walk away. After this introductory trial the child was asked "If the king finds a star, will he keep it or give it to you?" and, "If the robber finds a star, will he keep it or give it to you?". If the child did not answer these questions correctly, the researcher then explained again to the child what each puppet would do.

After the above introductory trial, the test trials began. Each child received eight test trials, four deceptive trials (with the bad robber puppet) and four co-operative trials (with the good king puppet). For each trial the puppets were hidden in the bag and the child was instructed to hide a star in one of the boxes. The king or robber (one being presented at a time) then reappeared and asked, "Where's the star?". Unlike in Sodian's (1991) experiment the intonation of the puppets was changed, using a happy intonation for the king puppet and a stern intonation for the robber puppet. This was done to maintain the child's interest and to reinforce who was the good and who was the bad puppet. If the child did not respond immediately, the experimenter said, "Where do you want to show the king/robber the star is?". If the child still did not respond, the experimenter asked which box the child wanted to point to. The king/robber then searched in the box indicated by the child and reacted in the way described in the introductory phase. The order of presentation of the puppets (i.e. king versus robber) was randomized.

Scoring: To score a point the child had to pass both a co-operative trial (with the king puppet), which was regarded as a control trial, as well as a deceptive trial (with the robber puppet), which was regarded as a test trial. A total of 4 points could be obtained from scoring in this way. In Sodian's (1991) study the co-operative trials were also scored. This was not done in the present study as it was felt that these trials did not give an idea of the child's understanding of deception (the aim of the experiment) and that they were, therefore, regarded as control trials.

APPENDIX B9: UNDERSTANDING EMOTIONS TASK

Procedure

Based on the procedure used by Tager-Flusberg and Sullivan (1995) pictures depicting the high points of certain episodes in the story "Frog On His Own" (Mayer, 1973) were shown to the children after they had related the story. For each picture the child was asked to give a brief account of what was happening in that part of the story. Then for each character the child was asked two questions:

"How does the ____ feel?"

"Why does the ____ feel ____?"

The child's responses were audio recorded and then later transcribed.

Tager-Flusberg and Sullivan (1995) used two pictures in their study, while in the current study four pictures were used (pictures 13, 18, 23 and 28).

Scoring

Five speech-language therapists working in the area of child language were asked to convey the emotion or emotions for each character shown in the four pictures that were used and were asked to relate why the character felt that way. The therapists were asked to record their responses in writing. These five therapists' responses were used to create a template to score the children's responses. The template was as follows:

PICTURE 13 (p. 13)

Frog

1) Scared/nervous/frightened
- Because the lady gave him a fright.
- Because the lady screamed.
- That she will chase after him/come get him.
- Because the lady threw a cup at him/The cup might hit him.
- The lady is cross (with him).

2) Frustrated
- Because he has nothing to eat.

3) Happy/glad
- That they did not catch him/hurt him.
- Because he got away/jumped away ("because he jumped" not acceptable).
- Because he gave the lady a fright.
- Because he thought it was funny/fun.
- Because the man fell down.
- Because he is having fun/He is getting up to mischief/Because he likes that/Liked doing that.
- Because he played a trick on them.

4) Relieved
- Because he escaped (from the lady).

5) Disappointed/sad
- Because he didn't get any food.

6) Upset
- Because the lady threw him.
- The cup nearly hit him.

Lady
1) Angry/cross/mad
- Because the frog ruined her picnic.
- That the frog had got into her picnic basket/was inside her picnic basket.
- That the frog had ruined her food.
- Because she does not like frogs.
- Because the frog gave her a fright.
- Because the frog made the man drop his juice/cup/The frog spilt the tea.
- Because the man is laughing at her.
- Because the frog went on her hand/climbed on her.

Man
1) Amused/jolly/happy/He felt like laughing ("He felt funny" not accepted and "He felt good" not accepted)
- Because the lady got such a fright.
- To see the lady so angry/upset at such a silly thing.
- He thought the frog was very funny.
- He thinks what happened was very funny.
- Because the frog went on the lady.

PICTURE 17 (p. 18)

Boy
1) Upset/sad/unhappy
- Because his boat sank/is sinking.
- Because his boat is (might be) broken/the frog broke his boat.
- Because the frog jumped on his boat.
- Because that was his favourite boat.

Lady
1) Cross/angry/annoyed/irritated/mad
- Because she has to get wet (to get the boat out of the water)/Because she has to go in the water.
- Because the frog broke the boat/made it sink/Because somebody sunk the boat.
- Because the frog jumped onto her little boy's boat.
- Because she has to get/save the boat.
- Because the frog upset her child.
- Because she had to go into the cold water.
- Angry that boy is crying.
- Because she thought the boy did it.

Frog
1) Relieved
- No-one caught him/He can swim away.

2) Guilty/bad/sheepish/embarrassed
- Because he broke/ruined the boy's boat.
- Because he sank the boat.
- Because he upset the boy.

3) Nervous/scared
- Because the lady might find him.

4) Upset/sad
- Because he didn't get to sail on the boat.

PICTURE 22 (p. 23)

Baby
1) Sad/upset/distressed/unhappy
- Because the frog got/took/stole his bottle.
- He wants his bottle/He wants to drink/He got no milk.
- Because the frog jumped into his pram.
- Because the cat jumped into his pram/on him.
- Because the cat hurt him.

2) Hungry/thirsty
- Because he wants his bottle.
- The frog took his bottle.

3) Angry/cross
- He doesn't have his milk.
- The frog took away his milk.

4) Frightened/scared
- Because the cat jumped into the pram/onto him.
- Because the frog jumped into the pram/onto him.
- His mother screamed.
- Scared she was going to get hurt.
- Scared of the frog because it's all gooey/slimy.
- Scared of the cat because he might think it's trying to eat him.

Cat
1) Eager to get the frog/wants to get the frog
- Because the frog took the baby's bottle.
- He likes (to eat/chase) frogs.

2) Angry/cross/mad
- Because the frog took the baby's bottle/Because the frog was trying to drink the baby's milk.
- Because he doesn't like frogs.
- Because the frog has the bottle.
- Because the frog jumped into the pram.

Frog

1) Surprised
- Because the cat jumped up.

2) Frightened/scared/terrified
- Because the cat jumped onto the pram.
- The frog saw the cat's sharp claws and teeth.
- Because the cat might eat him.
- He is scared of the cat.
- Because the cat is trying to scratch him.
- The cat is trying to stop him from taking the bottle.

Lady

1) Surprised
- Because she didn't see the frog.
- The frog gave her a fright.

2) Frightened/scared/shocked/startled
- Because she is scared of the frog.
- She is afraid of frogs/She doesn't like frogs.
- The frog gave her a fright.
- Because of the commotion.
- Because the cat pounced without warning/The cat jumped up.
- Because she had not noticed the frog taking the baby's bottle.
- Because the frog is on her/near her.
- Because she saw the frog.

PICTURE 26 (p. 28 and 29)

Boy

1) Angry/cross/mad
- Because the cat is chasing his frog.
- With the cat for trying to hurt/kill/harm the frog/his pet.
- Because the cat is attacking his frog.

Cat

1) Surprised/shocked/scared/worried/frightened/afraid/nervous
- Because the dog is chasing him/That the dog will start to chase her.
- That the dog will hurt her.
- She is scared of dogs/the dog/Cats are scared of dogs/Cats don't like dogs/Dogs are more powerful than cats.
- Because the dog is barking at him/Because the dog is angry.
- Because the boy is shouting at him.
- Because the dog has sharp teeth/He can see those sharp teeth.

2) Sad/disappointed/unhappy (not happy)
- Because he didn't get to eat the frog.
- Because the frog got away.
- Because he wanted the frog.

Frog

1) Relieved/happy
- To see his owner/friends/To be all together again.
- He has been saved/They saved his life.
- To have been rescued.
- He was free/He got away from the cat.
- His friends have saved him from the cat.
- Because the dog chased the cat away.
- Because the boy chased the cat away.
- Because he didn't die.
- Because the cat let go.

Dog

1) Angry/cross/defensive/mad
- With the cat for chasing the frog.
- With the cat for trying to hurt/kill the frog.
- With the cat for attacking the frog.
- Because the cat was trying to harm the frog.
- Because he doesn't like cats.
- He didn't want the cat to eat the frog (because the frog is his friend).

2) Brave
- Because he was chasing the cat away.

Turtle

1) Happy/glad/pleased/relieved/content
- He's not involved.
- To see the frog (again).
- That they have finally found the frog.
- That the frog/his friend is safe/back.
- That the frog never got hurt/That the frog is freed (saved).
- That the dog scared the cat away.

Credit was not given for reasons provided that did not correspond to the emotion the child had provided. For example, if in picture 22 the child gave the baby's emotion as 'frightened' but gave a reason that corresponded to one of the other emotions rather than 'frightened', this reason was not scored as correct. Furthermore, the reason given was only scored if the emotion given was correct.

This measure was scored out of a total score of 30. For each character in each picture one point was given if the emotion provided was appropriate. A further point was given if the child could provide an appropriate explanation/reason for the emotion. Across these four pictures the child was asked to provide and explain the emotion for 15 characters (giving a total score of 30).

APPENDIX B10: MEASURE OF PRETENCE

APPENDIX B10.1: DESCRIPTION OF PRETENCE TASK

This experiment was an adaptation of Jarrold et al's (1996) experiment of generating pretend acts. The procedure and scoring are described below.

Procedure: The main difference from their experiment was that in the current study Jarrold et al.'s (1996) with props and without props conditions were combined into one experiment. The child was asked to sit on a chair in a square marked by white cardboard strips. The cardboard strips were each one metre in length and twenty centimetres wide. Eight props were used. These consisted of the same items as in the original experiment and consisted of a candle, a scarf, a plastic colander, a plastic serving spoon, a clear plastic ruler, a plastic card index box, a small cylindrical metal tub and a large metal cake tin.

The game was first introduced to the child. The researcher told the child, "We are going to play a game of pretending. We are going to see how many things we can pretend to do. I will go first". The researcher then put the colander on her head and said, "I am pretending to be wearing a hat". She then took the ruler and pretended to be brushing her teeth saying, "I am pretending to be brushing my teeth". She then took the scarf and pretended to wash imaginary windows saying, "I am pretending to wash the windows". The researcher then said to the child, "What can you pretend to do?". The child was timed from this moment, with testing lasting for six minutes. Testing was, however, terminated under certain conditions. These will be described below. If the child started generating pretend acts before the researcher had demonstrated all three acts then timing was started, as for some children it was not necessary for the researcher to complete all three demonstrations to get them going. The experimenter then, however, kept any of these three acts that she had not yet demonstrated for later in the procedure if the child ran out of ideas and it was necessary to give the child an additional prompt.

If the child suggested a pretend act but did not carry it out, the researcher asked the child to show how he/she pretended to do that. Throughout the procedure the researcher encouraged the child by saying, "Well done" or "Good", "That's (naming how many pretend acts the child had carried out) pretend things. What else can you pretend to do?". The child was only allowed to use the same pretend object or pretend verb twice. If they used the same object twice, they were told, "You have done a lot of things with a … (naming the object, e.g. 'ball'). Now show me something different. What else can you pretend to do?". If the child used the same verb twice, he/she was told "You have done lots of … (naming the verb, e.g. 'cooking'). Now show me something different. What else can you pretend to do?". If the child carried out a functional act such as jumping the researcher said, "Good try, but that is not really pretending. You are really jumping up and down. What else can you pretend to do?". If the child said that he/she could not think of anything else or did nothing for fifteen seconds then the researcher prompted the child by showing the child pretend acts without props. This was done to allow children who had used the props extensively to carry out additional pretend acts without props. Here the researcher demonstrated the pretend act of reading a book by looking into her hands and saying, "I'm pretending to read a book". If the child again could not think of anything else to do or did nothing for fifteen seconds then the prompt of shooting a gun was demonstrated to the child. If this happened again the researcher

repeated one of the earlier pretend demonstrations with props. If this happened again the testing was stopped.

Scoring: This task was video recorded and was then rated later. Each act that the child produced was noted and credit was given for each pretend act that the child generated. The child was not given credit for:

- Repetitions of the researcher's prompts
- Exact repetitions of an act
- The third use of a pretend verb or object
- Acts that were clearly functional in nature, e.g. "jumping"
- Acts that were not adequately acted out
- Acts where the action did not correlate to what the child said, "I'm pretending to drive a car" while banging a tin.

Sequences of play were recorded as separate pretend events, as long as they clearly were so. For example, pretending to mix ingredients, pouring the mixture into a baking tin and placing the baking tin in an oven would be regarded as three pretend acts.

Raters were told to think of normal children's play and what would be regarded as acceptable pretence. Guidelines for understanding instances of pretence included (after Baron-Cohen, (1987) and Leslie (1987)):

- Object substitution (where the child substituted one object for another in his/her pretence), e.g. pretending that a ruler is a toothbrush.
- Giving an object a quality, e.g. pretending that pretend food is hot.
- Pretending that something absent is present, e.g. pretending to read an imaginary book.

Two scores were obtained:

- The number of attempts at pretence (which consisted of all the acts that the child produced, whether they were pretend acts or not)
- The number of instances of true pretence.

APPENDIX B10.2: INSTRUCTIONS TO RATERS FOR PRETENCE TASK

You will be shown video clippings of children engaged in a game of pretence. You are to record all acts that are actual pretence, as well as any acts where the child attempts pretence but which are not true pretence.

Description of task

The pretence task consists of a task similar to that used by Jarrold et al. (1996) where the child was required to generate pretend acts. Eight props were provided to the child, consisting of a candle, a scarf, a plastic colander, a plastic serving spoon, a clear plastic ruler, a plastic card index box, a small metal tub and a large metal cake tin. Testing lasted for up to six minutes and was stopped earlier under certain conditions. The researcher first modelled three pretend acts to the child: putting on a hat (using the colander), cleaning one's teeth (using the ruler), and washing the windows (using the scarf). If the child did not require all three acts to be modelled to get going, the remaining acts were modelled during the game (if the child required additional prompts during the game). The child was then asked what he/she could pretend to do and timing started from this moment. The researcher encouraged the child to act out any pretend acts that he/she suggested but that he/she did not spontaneously carry out by saying, "Show me how you pretend to do that". The child was only allowed to use the same pretend object or pretend verb twice. If he/she used the same pretend object twice, he/she was told "You have done a lot of things with a … (naming the object, e.g. 'ball'). Now show me something different. What else can you pretend to do?". If the child used the same pretend verb twice, he/she was told, "You have done lots of … (naming the verb, e.g. 'cooking'). Now show me something different. What else can you pretend to do?". If the child carried out a functional act such as jumping the researcher said, "Good try, but that is not really pretending. You are really jumping up and down. What else can you pretend to do?". If the child said that he/she could not think of anything else or did nothing for fifteen seconds then the researcher prompted the child by showing the child pretend acts without props. Here the researcher demonstrated the pretend act of reading a book by looking into her hands and saying "I'm pretending to read a book". If the child again could not think of anything else to do or did nothing for fifteen seconds then the prompt of shooting a gun was demonstrated to the child. If this happened again the researcher repeated one of the earlier pretend demonstrations with props. If this happened again the testing was stopped.

Guidelines for rating

1) Note each act produced.
2) Give credit for each pretend act generated. Regard an act as pretend if (after Baron-Cohen, 1987 and Leslie, 1987):

- The child substitutes one object for another, e.g. the child pretends the ruler is a spoon.
- The child pretends a missing item is present, e.g. pretending to wash with pretend soap.
- The child gives a property to an object, e.g. pretending pretend food is hot.

3) Do not give credit for exact repetitions of an act and repetitions of any of the researcher's prompts.
4) This child is allowed to use a pretend verb and a pretend object only twice. No credit is to be given for the third use of a verb or object. In this regard object refers to the object he/she is pretending not the actual object. For example, pretending the ruler is

a fish, a razor for shaving and something to mix with will all be given credit. However, if the child pretends that the ruler is a stick, the scarf is a stick and the spoon is a stick, he/she should only be give credit for the first two acts. When acting out a sequence, e.g. baking, the object can change, the mixture can later become the cake and then credit can again be given. Give credit for all the different pretend steps in a sequence of a play event, as long as the same pretend action or pretend object is not used more than twice. Similar actions, as long as they are still different, can be scored as two separate actions, for example, taking biscuits out of a tin and putting biscuits in a tin. However, if two actions are combined, for example, "throwing up a ball and catching it" they should be seen as one action, unless the child separates it into two actions, for example, "throwing a ball" and "catching a ball".

5) Do not classify an act as a pretend act if it is clearly functional in nature.
6) Only classify an act as a pretend act if the child adequately acts out his/her suggestions.
7) What the child says must correlate with his/her action in some way, for example, the child can't say that he/she is driving a car while banging on a tin, but could say he/she is a rugby player while wearing a scarf around his/her head. Therefore, there must be an adequate relationship between what the child pretends and what he/she is doing.
8) Give credit for a weak description of what the child is doing, if the description plus what he/she is acting out together makes it clear what the child is doing. For example, if the child says he/she is "doing the spaghetti" while he/she is shaking the colander, he/she would be given credit for pretending to strain the spaghetti.
9) Start timing from the point where the therapist has just said "Your turn. Now what can you pretend to do". Stop rating after six minutes or when the experiment is terminated, if it is earlier than six minutes.