

INITIAL PARENT AND SCHOOL REPORT

GROUP 3 (6-9 YEAR OLDS) ASSESSMENTS

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This group form part of a larger study which is examining Theory of Mind in children with Down syndrome. I aim to track the development of Theory of Mind skills from age 2 to 9. In total I have seen 10 children in this age group, from ages 6 years and 0 months, to 8 years and 11 months, with a really good spread across the age group.

Here are a few things that you are able to do as you develop a Theory of Mind, **some of them are very complex and don't fully develop until adulthood:**

- Know that things and people still exist even when you can't see, hear or touch them.
- Pretend and imagine in play.
- Understand different perspectives – know that other people see and think about things differently than you, and that they have different experiences than you.
- Put yourself 'in someone else's shoes' – and so work out why someone thinks or behaves the way they do.
- Be able to imagine a few perspectives all at once, and work out how those different perspectives might interact.
- Understand simple concepts of time – past, present and future.

Developing a Theory of Mind is important; it means children can be more flexible in their thinking and begin to use a wider set of skills, such as:

- Working out problems
- Imagining
- Using skills learnt in lots of different situations.

But these skills also put a huge strain on memory and brain power; you need to be able to think about lots of different solutions, perspectives and outcomes all at the same time.

ASSESSMENT TASKS

The tasks in this age group were designed to measure a number of skills; Theory of Mind, receptive vocabulary and working memory. As the tasks took about 45 minutes to complete the sessions were modified to suit individual children's needs.

British Picture Vocabulary Scales

In this task children were asked to listen to me say a word and then point to which picture described that word, out of a choice of 4. The words ranged in difficulty and included naming words, action words and descriptive words. The test is used with typically developing children and children with special educational needs and provides an estimate of a child's receptive (understanding) language age. .

Theory of Mind – False belief task

This task asks children to track the knowledge of another person. They were asked to follow the story of Maxi and Dinah:

Dinah has a special toy. She hides it in a drawer so that Maxi won't play with it. Then she leaves the room.

Maxi takes the toy and hides it in a different place, a box.

Dinah comes back in.

Where will Dinah look for the toy?

We played out the story in a number of ways; we used dolls to act out the story, we read a book which had the story and we used an ipad to take pictures of the story. The children were involved with the story telling and helped me to act it out with the dolls. The purpose of this task is to discover whether the child has reached the developmental stage of being able to put aside their own view of the world (that they know where Dinah's toy has been moved to) and imagine someone else's view of the world (that Dinah doesn't know her toy has been moved). If they are able to imagine Dinah's false belief they would say that she will look for the toy in her drawer; the place she left it.

Working memory – digit span task

This task measures how many numbers a child can remember in sequence. I said a number and the child would either verbally repeat it, or point to it on a Numicon number line. After 6 correct attempts at 1 number we then went on to 2 number sequences and after 6 correct again, 3 number sequences. This task helps us to know how effective a child's working memory is. This may be important in assessing Theory of Mind as Theory of Mind tasks usually require a lot of working memory (such as being able to remember the Dinah/Maxi story above).

Theory of Mind – false contents

I showed the child either a box of chalks or a mini box of Cornflakes. I asked them what they thought was inside. Then together we looked inside the box and discovered either a sock (in the chalk box) or some colouring pencils (in the cereal box). I then asked the child what they thought was in the box *before* we opened it. The purpose of this task is to see whether children can override their current knowledge to remember what their own false belief was. An ability to do this could mean that they are able to imagine, in their mind, a different state of affairs than the one in front of them (we call this 'representation').

RESULTS

The results I will report here are from my initial look at the data; please remember **I am reporting about the whole group of children and not about individuals**. I will firstly describe what I have seen so far, and then explain how I plan to look further into the data I have collected.

BRITISH PICTURE VOCABULARY SCALES

I included this measure in my study for two reasons: firstly because I needed a standard measurement of language so that I could see if there was a relationship between language and Theory of Mind; secondly, because I wanted to examine how effective this test was for children with Down syndrome.

The results of the BPVS show that those children who score an age of over 4 ½ in receptive vocabulary are more likely to occasionally pass the Dinah/Maxi task. This is in line with studies of typically developing children who tend to pass the Dinah/Maxi task (usually called Sally/Anne) when they are between 4 and 5 years old. This might tell us that receptive vocabulary is a fair indication of when children are reaching the developmental stage of beginning to understand others' points of view.

However, this needs to be reported with caution, as the other reason for my using the BPVS was to consider how useful it is in measuring receptive language in children with Down syndrome. The test was used twice and the results of the two testing points show different results for most children in the study. There are a number of reasons this could have happened:

- a. On the second test many of the children remembered the test and were reluctant to do it again as they didn't enjoy it.
- b. Many children showed signs of boredom when being tested.
- c. Children pointed incorrectly at words they got correct at the last test.
- d. Children were distracted by the pictures and wanted to talk about them rather than completing the test.
- e. Children were happy to try the test when they found it easy, but when the words became challenging they often lost interest.

For some children the motor skills (pointing) needed to access this test were too demanding, and so this means their receptive language was not measured. The variability of results has implications for how we measure the receptive language of children with Down syndrome; if a test is not accessible for all children with Down syndrome then we need to consider whether it is appropriate for this group of children.

THEORY OF MIND – FALSE BELIEF TASK

Most of the children in this study were not yet able to recognise that, because Dinah was out of the room when the toy was moved, she would look for it in the place she had left it. Children usually directed Dinah to look in the place Maxi had hidden the toy. Two other questions were asked – '*Where did Dinah put the toy?*' and '*Where did Maxi put the toy?*' 20% of children were able to answer these questions correctly, but still made Dinah look in the incorrect place; this could suggest that their memory function is not stopping them from remembering the story sequence, but that their Theory of Mind has not yet developed. 35% of the children were able to remember where Maxi moved the toy to, but said that Dinah had left the toy in the same place, perhaps indicating that they were very fixated on the toy, and the rest of the story was not easily remembered. In terms of Theory of Mind this may mean that they are not mentally ready to deal with complex stories and lots of different representations. Where children did pass all three questions on the Dinah/Maxi task there was usually inconsistent passing, and it was usually the older children in the group.

WORKING MEMORY – DIGIT SPAN TASK

This task was difficult for all the children in the study, some children found the pointing aspect hard to master and for others the demands of number recognition or memory function limited their scores. Children of similar ages showed different scores and there was no particular age pattern, children also performed differently on the first and second times of testing. This wide range of results which shows how complex the development and assessment of working memory is in children with Down syndrome and that we cannot rely on results from one or two testing times. What we are able to see from this however, is that the working memory function in this group was not as well developed as typically developing children of the same age.

THEORY OF MIND – FALSE CONTENTS

The results of the false contents task showed that the children in this group were very individual and that tests we use for typically developing children are not necessarily appropriate for children with Down syndrome. The question 'What do you think is in the box?' prompted a range of answers; 'I don't know', 'A sock' (recalled from the last session!), 'A chicken' (in response to the Cornflakes box!), and 'Let's have a look' (a very sensible answer to my question). What this shows us is that the types of questions we ask typically developing children in testing situations (or in educational settings) can mean quite different things to a child with Down syndrome. Typically developing children can quickly pick up on social cues, so my question 'What do you think is in the box?' to them would mean 'I'm asking you to tell me what you think could be in the box, even though you know I know the answer, because this is a kind of test.' Whereas a child with Down syndrome may not respond to this kind of social cue and become confused that I am asking what is in the box when it is my box and I probably know the answer.

When the children were asked 'What did you think was in the box before we opened it?' most of the group responded with whatever was actually in the box. This could mean that either there was a difficulty with recall or that it was difficult for them to represent their prior false belief (or a combination of both). This is a similar mistake that typically developing children under the age of 5 make, before they have developed a Theory of Mind.

FURTHER ANALYSIS

My work looking at the results from this group has only just begun. My next area of analysis is to examine how the children use gesture, eye contact, movement, sound and language to get their ideas across. This will form a large part of my understanding of how the children are responding to the tasks and will run alongside the information I have already outlined above. Examining my data in this way will allow me to consider all aspects of communication when reporting whether children are passing or failing tasks, and to make links between the behaviours I observe and the outcomes of the assessments.

I will also carefully examine how closely linked all the assessment tasks are and whether we can suggest that one area of development could be linked to another, for example, is language linked to Theory of Mind? This may enable me to tentatively suggest relationships in development which are affecting children with Down syndrome.

My analysis of this group will then be linked in with the other age groups to try and establish similarities in behaviour and links across the age groups, to give us a pattern of development.

I will be creating further reports for parents and schools as my analysis of the assessments continues. By the end of the year I hope to be able to draw together all the strands in my work and produce a document for you which outlines my final findings.

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