

Evaluating the ability of children  
with social emotional behavioural  
and communication difficulties  
(SEBCD) to express their views  
using Talking Mats

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Final report to NHS Forth Valley

January 2006

**Forth Valley Primary Care Operating Division**  
**Form 8**

<b>Final report form</b>	Reference number: 133
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**Please complete this form in 12 point font size**

Project title: Evaluating the ability of children with social emotional behavioural and communication difficulties (SEBCD) to express their views using Talking Mats	
Start date: 01/04/2005	Finish date: 30/01/2006

Grantholders:

Laura A Coakes	

**WORD COUNT: (excluding tables) 3731**

**SUMMARY:**

Talking Mats (TM) is a low tech communication framework developed at the University of Stirling which has been proven to enable adults with communication, cognitive and physical difficulties to express their views<sup>1</sup> (Appendix1). Aitken & Miller<sup>2</sup> have identified the usefulness of this approach when listening to children with communication support needs and it is increasingly being used as a clinical tool to obtain the views of such children. The effectiveness of this approach when used with children with social emotional behavioural and communication difficulties (SEBCD) has not been evaluated. This pilot study aimed to establish if TM increases the quality and amount of information that children with SEBCD are able to give when consulted on their views.

**AIM:**

1. To determine if the use of TM increases the ability of children with SEBCD to express their views in comparison to a verbal discussion.

## METHODOLOGY

### *Stage 1: Selection of Participants*

Approval from the NHS Research Ethics Committee was obtained. The Head and Depute teachers and senior social worker of an identified special school for children with social emotional and behavioural difficulties (SEBD) were provided with written information about the study. The researcher then met with them in order to identify 6 suitable participants based on the following selection criteria:

Participants must attend the school and have a current diagnosis of:

- A moderate-severe receptive and/or expressive language delay.
- A moderate-severe receptive and/or expressive language disorder.
- Communication difficulties associated with an autistic spectrum disorder.
- They must understand language that contains more than two key pieces of information at a time.

Table 1 provides demographic information on the participants.

<b>Participant</b>	<b>Age</b>	<b>Medical Diagnosis</b>	<b>Main Communication Method (MCM)</b>	<b>Speech &amp; Language Diagnosis</b>
<b>1</b>	7.11	Autistic Spectrum Disorder (ASD)	Speech	Severe expressive, receptive and pragmatic language disorder associated with ASD
<b>2</b>	10	Attention Deficit Hyperactivity Disorder (ADHD)	Speech	Moderate receptive delay & expressive language disorder.
<b>3</b>	7.9	No known aetiology	Speech	Moderate receptive & expressive language delay.
<b>4</b>	7.11	ASD	Speech	Moderate expressive & receptive language delay.
<b>5</b>	10.2	ADHD	Speech	Moderate receptive & severe expressive language disorder.
<b>6</b>	8.6	No known aetiology	Speech	Moderate expressive and receptive language delay.

### *Stage 2: Consent*

Each participant's school social worker contacted the parents/carers to ascertain if they wished to be considered for participation in the study. The researcher and social worker then visited the parents/carers at home, discussed the purpose and benefits of the study, and provided them with a written information sheet (Appendix 2).

### *Stage 3: Identification of topics and picture symbols*

Initial discussion took place with the senior social worker, head and depute teachers in order to identify a topic that would be relevant for all the participants. The topic “My school day” was agreed. Discussion then took place with each participant’s social worker and class teacher in order to identify the individual subjects and associated picture symbols that make up the options. The following 20 were agreed: Coming to school in the taxi, taking shoes and coats off, breakfast Club, maths, choosing, morning break/snack, computer, language, ERIC time (Everyone Reading In Class), lunch/break, French, topic, music, art, PE, circle time, assembly, golden time, shoes and coats on and taxi/car to go home.

### *Stage 4: Interviewing Participants*

Interview 1: The purpose and process of the study was explained to participants in written, verbal and pictorial form immediately prior to the first interview. Care was taken to adapt the information and consent forms to take account of the children’s developmental level and communication difficulties (Appendix3). The views of participants on their school day were then obtained using either a) TM or b) Using their main communication method (MCM) which for all the participants was verbal questioning and answering. The interviews were counterbalanced to ensure that any influences from one type of interview to the other could be identified.

Interview 2: This took place 2 weeks later. Both interviews were video recorded. A digital photo was taken of each completed “mat” as a record of the participant’s views and each participant received a copy of their photograph.

### *Stage 4: Analysis*

A. The video recordings of both interviews were analysed using a five point coding framework (Appendix4) which identified the following points as being indicators of effective communication.

1. Participant’s understanding of the issue for discussion
2. Participant’s engagement with interviewer
3. Confidence of participant in articulating views/placing symbols
4. Interviewer’s understanding of participants views
5. Participant’s satisfaction with their confirmed views

A consensus approach was used to rate the data. The researcher and an independent observer viewed the data at the same time and scored their judgements without knowledge of each others’ scores. There was 85% agreement and the remaining 15% were discussed until a consensus was reached.

B. The time taken for both interviews was recorded and compared.

C. The percentage of on-task behaviours were analysed using a 10 second time series analysis based on a procedure designed by Lower<sup>3</sup>. On task behaviours were defined as:

1. Purposeful and controlled eye contact towards the interviewer.
2. Purposeful and controlled eye contact with objects or visual stimuli connected with the interview.
3. Active engagement – defined as attending to the interview process and being responsive to interview prompts and stimuli.

Participants were recorded as off task if they:

1. Did not exhibit any of the above behaviours.
2. Handled objects not related to the interview.
3. Exhibited abusive, restless or avoidant behaviour e.g. standing up, turning away from the interviewer or shouting.
4. Talked about a subject not related to the interview materials or process.

To assess reliability the researcher and an independent observer initially rated the TM and MCM interviews of two of the participants. A percentage agreement was then used to calculate the inter-observer reliability. This was found to be above 95%. As 70% is generally considered an acceptable level of agreement between observers the researcher then proceeded to rate the remaining interviews<sup>4</sup>.

D. The participants' use of a mid point was counted for both interviews. A verbal mid-point was defined as a word or phrase that does not infer a definite negative or positive. For example "in between" "not sure" "sometimes I do sometimes I don't".

E. To further substantiate the quantitative data the following were examined thematically:

1. The language used during both interviews to compare the range of vocabulary used and effectiveness.
2. Participant's non-verbal comments during the interviews to examine if they concurred with the views expressed verbally or on the mats.
3. Views expressed in both interviews to compare similarities and differences.

## **RESULTS**

The data from the counterbalanced interviews identified no significant influence from interview 2 to interview 3.

### **A. Effectiveness Coding Framework.**

The following figures show the participant's score on each indicator.

Figure 1: Participant's understanding of the issue being discussed

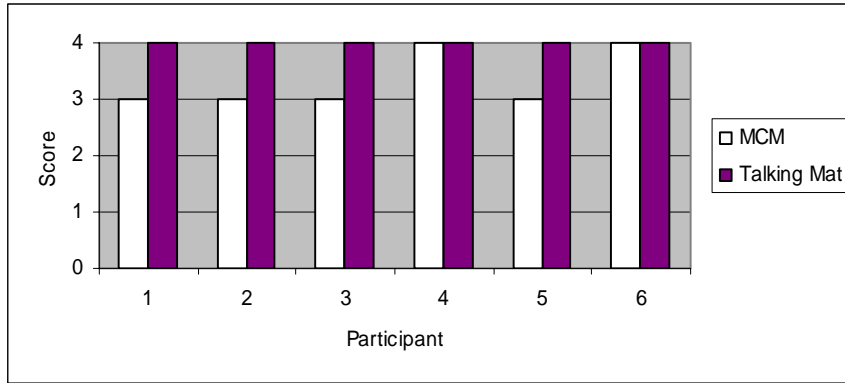


Figure 2: Participant's engagement with interviewer

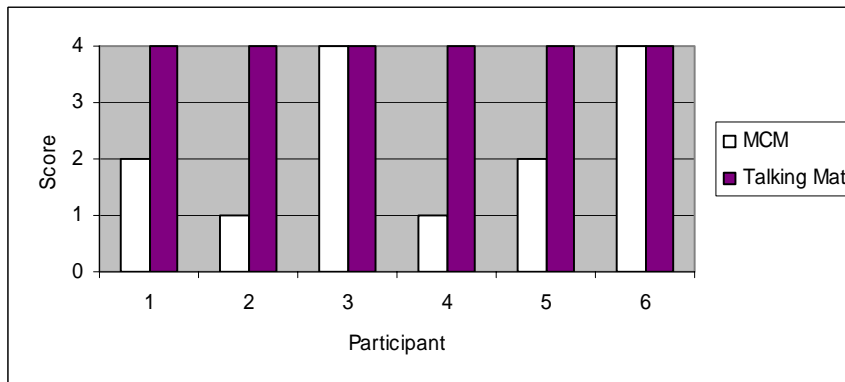


Figure 3: Confidence of Participant in articulating views/placing symbols

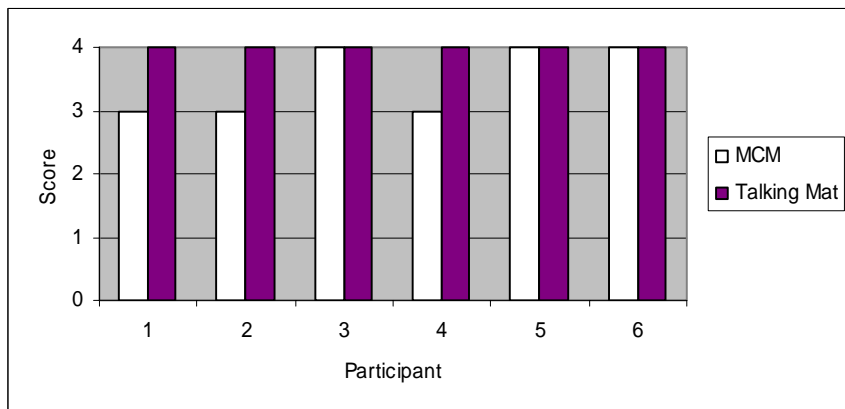


Figure 4: Interviewer's understanding of client's views.

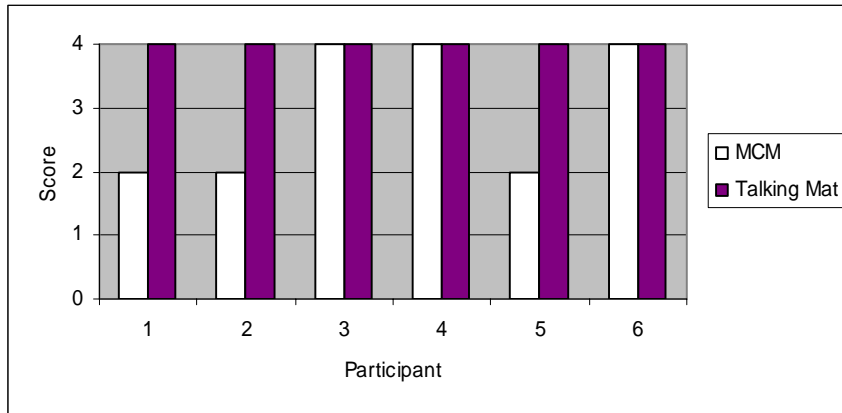
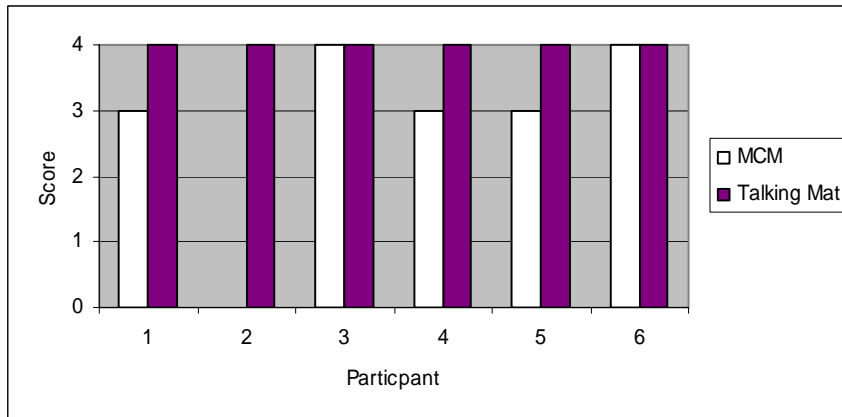
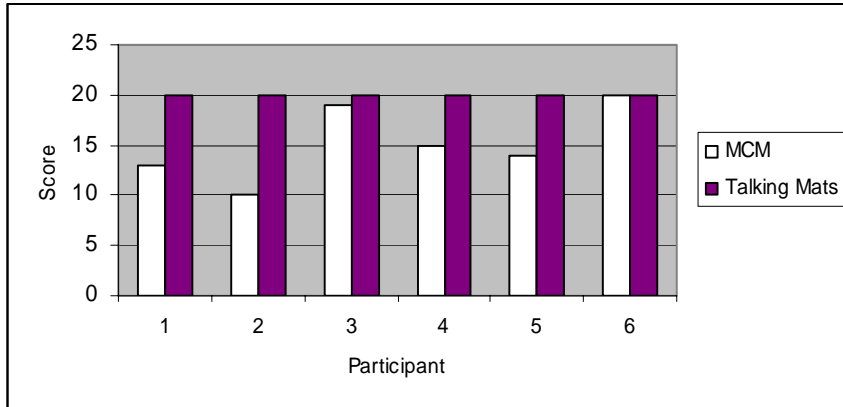


Figure 5: Participant's satisfaction with confirmed views.



On all of the indicators from the effectiveness coding framework the scores for participants 1 and 2 were higher when using TM than their MCM. Participant 3 scored higher on engagement with the interviewer when using TM, on all the other indicators no difference was found. Participant 4 scored higher on 3 out of the 5 indicators. Participant 5's scores were greater on all indicators when using TM except one; confidence in articulating his views, on this indicator no difference was found. For participant 6 no difference in effectiveness was found on any of the indicators.

Figure 6: Aggregate scores for effectiveness coding.



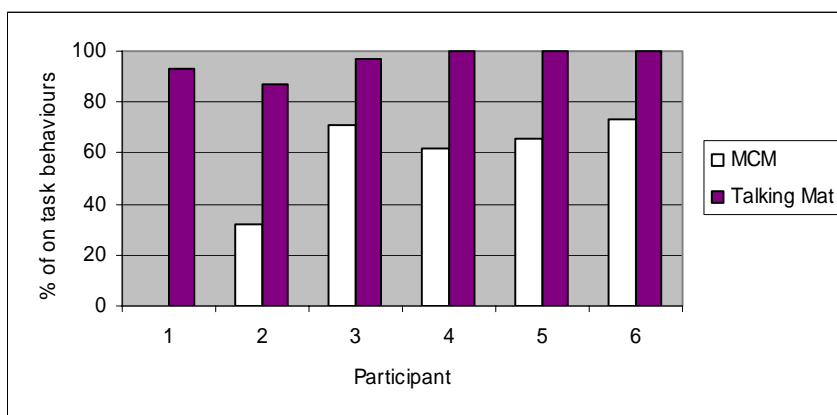
The aggregate scores show that most participants communication effectiveness increased when using a TM compared to their MCM. However the difference in effectiveness varied between individual participants.

### B. Time Taken

The table below shows that 4 out of 6 participants interacted for longer when expressing their views using TM.

Participant	1	2	3	4	5	6
Time TM	11.48	4.26	4.53	6.59	14.20	3.11
Time MCM	11.34	3.47	5.42	2.49	4.32	4.00

### C. On task behaviours



The graph above shows that for all participants the percentage of on task behaviours was greater for the TM interview than for the MCM interview.



#### **D. Use of the mid point.**

The table below shows that all the participants used a midpoint during the TM interview but only 2 used it during the verbal interviews.

<b>Participant</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>TM</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>MCM</b>	No	No	Yes	No	No	Yes

#### **E. Substantiation of quantitative data.**

##### 1. Language:

Participant 5's comments during the TM interview were grammatically more complex and he used a wider range of vocabulary. During the verbal interview the only language he used to state his views was "fine" "un-fine" and "not fine" with no elaborations about why he felt this way. However during the TM interview he used a wider range of vocabulary, more sophisticated syntactic structures and elaborated upon his views. For example: "Putting that under that 'cos I don't know if I like it or if I don't like it", "I'm not sure" "Great!" "Oh yeah!" "like 'cos I like playing football with Jim when I'm on his team".

On two occasions during the MCM interview participant 1 made a semantic error, substituting "too good" for "too hard" No such errors occurred during the TM interview.

During the MCM interview participant 1 made regular conversation topic shifts for prolonged periods of time. These were generally linked to his special interests and/or triggered by a semantic link. For example he elaborated; "I don't like lunch time 'cos I don't like the crust on the bread, you know, the hard crust". The word crust then triggered him to talk about the "mantle of the earth". On occasions the rapid topic shifts resulted in the interviewer being unable to establish his view or understand his meaning. During the TM interview the conversation topic always remained focussed on the subject being discussed.

Participants 3 and 6 stated a wider range of views during the verbal interview than during the TM interview. For example participant 6 expressed the following:

TM: "don't like" "boring" "in between" "alright" "like" "happy happy"

Verbal Interview: "hate" "boring" "dinnae like it" "in between" "fine" "like it" "favourite" "happy" "good" "love it"

##### 2. Non-verbal Comments

During the verbal interview the non-verbal responses of participants 2, 4 and 5 did not reflect the views they expressed verbally. For example one participant frequently said, whispered or shouted "good" whilst facing away from the interviewer with his head down on his knees covered by his arms and/or giving the camera an abusive hand gesture. Another participant repeatedly commented "good" whilst holding his head in his hands.

During the TM interview all the participants' non-verbal responses reflected their placement of symbols on the mat. Such responses included frowning, shaking their heads and/or banging symbols on to the mat for "don't like". Smiling, looking up and/or eyes widening for "like" and using a shaky hand gesture for not sure.

### 3.Views Expressed

The views expressed by the participants differed on a varying number of subjects between interviews. The following patterns were observed:

Participants 1, 2, 4 and 5 changed their views on 2 - 4 subjects due to their use of the mid point in the TM interview.

Participant 5 repeatedly commented "fine" for 18 out of the 19 presented subjects during the verbal interview. In the TM interview he then changed 10 of these to a negative view and 4 to the mid point.

## **DISCUSSION**

### **Participants 1,2,4 & 5**

#### **Engagement**

Establishing and maintaining engagement is a necessary pre-requisite for eliciting a child's views. No matter how effective a resource is in promoting linguistic skills, if the individual will not engage, the resource is redundant. The above participants all have a diagnosis of either ASD or ADHD (see table 1) and are consequently children who are hard to engage. This study found that for these participants the use of TM increased their level of engagement. This is based on an increase in the engagement effectiveness indicator score, the percentage of on task behaviours during the TM interview and the length of time of the interview.

During the MCM interview their behaviour included turning lights on and off, talking for prolonged periods about an unrelated topic, putting feet on the table and swinging on chairs. Negative non-verbal responses often contradicted the positive view they were giving verbally, for example aggressively shouting "good". Some of the non-verbal behaviours displayed appeared to be anxiety related, for example repetitive hand movements.

These findings suggest that participants found it difficult to listen, process and respond during the MCM interview and that being interviewed verbally was an unsatisfactory, stressful experience for them. They may not therefore have given an informed or considered response to the questions due to their difficulty in attending and their desire to finish. This is illustrated by participant 5 repeatedly commenting "fine" for 18 out of the 19 presented subjects.

In contrast during the TM interview behaviours included participants remaining seated and still, looking at the materials and interviewer, making jokes and mirroring the interviewer's body movements. Their non-verbal responses reflected the views they

expressed verbally or their placement of symbols on the mat. The interviews lasted longer and the pace generally slower.

The focus of the mat and the act of placing the symbols interrupted eye and direct face to face contact between the participants and interviewer. This interruption, which in AAC literature is cited as a negative aspect of symbol use, may have contributed to the participant's positive changes in behaviour; The TM decreased the pressure on them to communicate directly with the interviewer and shifted the focus of attention from them to the mat. This in turn created a less threatening situation which promoted attention to the task and willingness to communicate and interact<sup>5,6</sup>.

It can therefore be seen that the multi-modal (symbols and words) interactive approach of TM facilitated engagement and fostered social closeness; The process of looking, listening, doing and talking held participants attention and in doing so enabled them to relax, think, ask questions and respond in an informed manner<sup>1</sup>.

### **Communication Effectiveness**

The findings show that for these participants the use of TM increased their communicative effectiveness, augmenting their verbal and non-verbal communication skills.

They expressed a wider range of views when using TM than when using their MCM. This is demonstrated by their non-verbal and verbal use of the midpoint during the TM interview to indicate the concept "not sure". The visual symbol and explanation of "unsure" at the start of the interview appeared to help the participants to use a wider range of language concepts to think about and express their feelings.

The use of the midpoint in the TM interview also prompted participants 1 and 2 to monitor their own comprehension. They placed a subject under the midpoint and spontaneously verbally asked what it was.

The increase in the vocabulary used, sophistication of syntactic structures and elaboration by participant 5 during the TM interview may be directly linked to his increase in engagement and therefore willingness to say more.

The visual framework and process of completing the TM for participant 1 also increased topic maintenance. The focus of the mat meant that he became less distracted by his own thoughts.

These findings illustrate the value of using visuals to support the expressive language skills of children whose MCM is speech.

### **Participants 3 & 6**

#### **Engagement**

The effectiveness indicator did not show a difference between the interviews in the level of engagement for participants 3 and 6; both participants were “always” engaged. However they did show an increase in the percentage of on task behaviours. This may be attributable to the fact that the on task analysis was more sensitive to change than the coding framework indicator.

### **Communication Effectiveness**

For these participants the use of TM made minimal or no difference to their communication effectiveness when compared with their MCM. In fact they expressed a wider range of views during the MCM interview. This may be attributable to these participants being linguistically more able than the other participants. Also, the 3 point visual scale may have not offered them enough range and may therefore have limited their responses. Use of a 5 point scale may have produced different results.

### **CONCLUSIONS**

This study has fulfilled the aims of the original proposal and identified if the use of TM increases the ability of children with SEBCD to express their views in comparison to a verbal discussion.

For children with moderate language delay TM has not been proven to increase their ability to express their views in comparison to their MCM. However it does facilitate engagement.

For children with SEBCD and ADHD or ASD and associated moderate/severe language difficulties TM has been proven to increase their ability to express their views in comparison to a verbal discussion. This is achieved by TM facilitating both engagement and linguistic ability.

### **IMPORTANCE TO NHS AND POSSIBLE IMPLEMENTATION**

TM is a low cost, easy, readily available low-tech communication resource. It is already being used as a clinical resource by speech and language therapists, teachers and social workers to obtain the views of children with communication difficulties.

TM has a valuable role to play in consulting and listening to children. In Scotland this is a legislative necessity: The Standards in Schools Act 2000<sup>7</sup>, Children (Scotland) Act 1995<sup>8</sup>, the Age of Legal Capacity (Scotland) Act 1991<sup>9</sup> and the Education (Additional Support for Learning) (Scotland) Act 2004<sup>10</sup> all require the views of children to be sought, considered and taken into account during decision making.

For child services within the NHS, TM is a resource that can be used to establish rapport and obtain clients views on a range of issues including individual clinical interventions and services.

At the school involved in the project the findings of this study have been used to inform ongoing change to the consultation process that takes place prior to multi-disciplinary

meetings. The Speech and Language therapist is now using TM to elicit pupils' (with communication difficulties) views prior to review meetings and these views are then shared in written, photograph and video form with the child's family and all the agencies involved. The school are investing in TM training that is to take place in January 2006 to enable all staff to use this resource.

The findings from this study will be integrated into the regular training courses on TM which are being requested not only by a range of NHS staff but also by staff in partner agencies e.g. social services and education.

### **FUTURE RESEARCH**

- Investigate if the findings of this pilot study are reflected in a study that involves a larger population, including older children.
- Investigate the incidence/effectiveness of use of visual strategies (Drawing, symbols, Comic Strip Conversations) with children with social emotional and behavioural difficulties when reflecting and learning from crisis situations (Life Space Interview within Therapeutic Crisis Intervention<sup>12</sup>)
- Investigate if the use of a more sensitive visual scale with children with language disorders has a positive impact upon their ability to express their views.

### **DISSEMINATION**

- Workshop training is planned for the staff at the school involved in the project.
- Findings were presented to Barnardo's National Conference November 29<sup>th</sup> "Education – The Centre of Every Child's Future"
- Paper to be presented at the Speech Pathology Australia National Conference on the 24 May 2006.
- Information will be posted on the website – [www.aacscotland.com](http://www.aacscotland.com)
- Findings disseminated to NHS Forth Valley Learning Disabilities Team.
- Paper to be submitted to relevant journals.

### **RESEARCH WORKERS**

This study was carried out by Laura A Coakes, Speech and Language Therapist with supervision from Joan Murphy Research Speech and Language Therapist.

### **FINANCIAL STATEMENT**

To be provided by finance department

## **EXECUTIVE SUMMARY**

### **Aim**

To determine if the use of Talking Mats™ increases the ability of children with SEBCD to express their views in comparison to a verbal discussion.

### **Project Outline/Methodology**

Six children were interviewed twice about their views on school. Once using TM and once using their MCM (speech). All the interviews were video recorded and photos were taken of the completed mats and given to the participants. The results were analysed for communicative effectiveness using a five point coding framework, an on-task analysis, the time taken and the use of the midpoint. The data was also examined thematically.

### **Key Results**

- Aggregate scores show that most participants communication effectiveness increased when using a TM compared to their MCM. However the difference in effectiveness varied between individual participants.
- 4 out of 6 participants interacted for longer when expressing their views using TM.
- For all participants the percentage of on task behaviours was greater for the TM Interview than for the MCM interview.
- All the participants used a midpoint during the TM interview but only 2 used it during the verbal interviews.
- 4 out of 6 participants expressed a wider range of views during the TM interview than in the MCM interview.

### **Conclusions**

The findings show that for children with moderate language delay TM do facilitate engagement. However they have not been proven to increase their ability to express their views in comparison to their MCM. This result however is based on a small sample and may be attributable to the TM not being sufficiently differentiated for these children.

For children with SEBCD and ADHD or ASD and associated moderate/severe language difficulties TM has been proven to increase their ability to express their views in comparison to a verbal discussion. This is achieved by TM facilitating both engagement and linguistic ability.

This study demonstrates the value of TM™ as an effective tool for consulting and listening to children with social, emotional, behavioural and communication difficulties.

### **What does this study add to the field?**

This study provides a model of research to ensure that children with SEBCD are not excluded from studies.

### **Implications for Practice of Policy**

- TM has a valuable role to play in consulting and listening to children.
- Information from this study should be used in the training of health, education and social services staff.

### **Where to next?**

- Investigate if the findings of this pilot study are reflected in a study that involves a larger population.
- Investigate the incidence/effectiveness of use of visual strategies (Drawing, symbols, Comic Strip Conversations) with children with social emotional and behavioural difficulties when reflecting and learning from crisis situations (Life Space Interview within Therapeutic Crisis Intervention<sup>12</sup>)
- Investigate if the use of a more sensitive visual scale with children with language disorders has a positive impact upon their ability to express their views.

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## Appendix One

Joan Murphy devised the framework called Talking Mats (literally mats with pictures attached) during a research project in 1998. Talking Mats was originally developed to help people with communication difficulties to think about the issues discussed with them and to express their opinions. Since then Talking Mats has been used with many people with and without communication difficulties both in the UK and abroad. People who have used Talking Mats have found it enjoyable and easy to use. It is not an assessment, but rather a tool for helping people to express themselves. Recent research has proved it improves the quality and quantity of information gained.

Talking Mats is an interactive resource that uses 3 sets of picture symbols – topics, options and visual scale.

■ **topics:** whatever you want to talk about (e.g. pictures symbolising what do you want to do during the day, where you want to live, who do you want to spend time with, ....

■ **options:** relating specifically to each topic. For example, whether you want to go to college, attend a day centre, stay at home, ....

■ **visual scale:** in order to allow participants to indicate their general feelings about each topic and option. For example, whether they are happy, unsure, unhappy.

Once the topic is chosen e.g. ‘what do you want to do during the day?’ the participant is given the options one at a time and asked to think about what s/he feels about it. S/he can then place the symbol under the appropriate emotion to indicate what s/he feels. It allows topics to be explored at different levels. The use of both video and digital camera are used, the former to ensure non verbal communication is taken account of and the latter to give a permanent record of the mat.

## Appendix 2

### **Evaluating the ability of children with social emotional behavioural (SEB) and communication difficulties to express their views using Talking Mats™**

#### **Would you like your child to take part in a research study?**

Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Thank you for reading this.

#### **What is the research about?**

The purpose of the research is to evaluate if the use of Talking Mats™ increases the ability of children with SEB and communication difficulties to express their views. Talking Mats™ has been identified as a useful approach to use when listening to children with communication support needs. However the effectiveness of this approach when used with children with SEB and communication difficulties has not been evaluated.

The study will run for nine months starting in April 2005. Five other children will be involved in the study. Your child has been chosen because they attend Lecropt School and Family Support Service and have a communication difficulty.

#### **Deciding to participate**

It is up to you to decide whether or not your child takes part. If you agree you will be asked to sign a consent form. If you decide to take part you can withdraw your child at any time without giving a reason. A decision to withdraw at any time, or a decision not to take part will not affect the standard of care your child receives. The project will also be explained to your child using speech and pictures and their agreement sought.

#### **What it would mean for your child**

Your child will be interviewed twice regarding their views on school: Once using the Talking Mats™ framework and once using speech. The interviews

will last approximately 30 minutes and will be video recorded. The interviews will take place in Lecropt School in the family or general purpose room.

All personal information will be treated as confidential and will be stored in a locked filing cabinet, not on a computer. The tapes will be destroyed after 15 years.

### **What is Talking Mats™?**

Talking Mats™ are a visual framework that use picture symbols to help people with a communication difficulty understand and express their views. See attached sheet.

### **Possible Benefits of the Study**

If successful the study will have identified a tool that parents/carers and Lecropt staff could use to help children effectively express their views.

### **Results of the Study**

The results of this study will be available in a written report in January 2006. No individual will be identified in the report.

### **Funding and Organisation**

The research is funded by Forth Valley Primary Care Operating Division. Local Research Ethics Committee have reviewed and approved this study.

You will be given a copy of the information sheet and a signed consent form to keep.

### **The Researcher**

Laura Coakes is a speech and Language therapist who is currently employed by Forth Valley Primary Care Operating Division.

I can be contacted in any of the following ways:

By Letter: Laura Coakes, AAC Research Unit, University of Stirling,  
Stirling, FK9 4LA

By telephone: 01324 404040

By email: [laura.coakes@fvpc.scot.nhs.uk](mailto:laura.coakes@fvpc.scot.nhs.uk)



It's up to you to decide if you want meet with me.

yes



no



You can stop at any time.



What will we do?

We will meet twice in the family or general purpose room



The first time we will talk

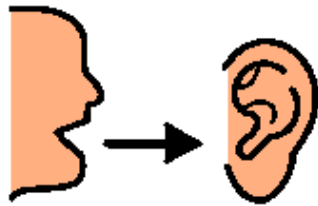


The second time we will do a Talking Mat



Five other children from Lecropt will be doing it too.






If you like the talking mats and they help you to say what you think, other people like your social worker or teacher might be able to do them with you. This will help grown ups to listen to you at other times.



If you want to help you could sign (write your name) the pink consent form.



## Appendix 4

Talking Mats™- Effectiveness Coding Framework						
	4  Always	3  Often	2  50:50	1  Occasional	0  Never/none	N/A
Participant's understanding issue for discussion						
Participant's engagement with interviewer						
Confidence of participant in articulating views/placing symbols						
Interviewer's understanding of client's views						
Participant's satisfaction with their confirmed views						

- By engagement we mean the social closeness that is established in the interaction and maintained through rapport and joint attention.
- Confidence is demonstrated by the participant's verbal, nonverbal and motor response.