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### A good read

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## Chapter 3 One More Time?

Factors influencing attentiveness of people with profound intellectual and multiple disabilities to Multi-Sensory Storytelling

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### 3.1 Introduction

Almost everyone, regardless of whether or not they have disabilities, enjoys listening to a good story. Parents, grandparents and teachers read to children in order to increase their understanding of spoken text and/or to extend their vocabulary (Dickinson & Smith, 1994). Despite positive examples of literacy education (Lacey, Layton, Miller, Goldbart, & Lawson, 2007), storytelling to persons with profound and multiple intellectual disabilities (PIMD) is not common practise (Lyons & Mundy-Taylor, 2012; Ten Brug, Van der Putten, Penne, Maes, & Vlaskamp, 2012). This might be because storytelling is seen as an activity that takes an understanding of spoken words and sentences as prerequisite, therefore potential storytellers might not see the added value of telling a story to a person with PIMD (Ten Brug et al., 2012). The profound intellectual disability (IQ below 20 points) of people with PIMD results in a limited use, interpretation and understanding of spoken words. This makes it unclear whether they understand the text and fully grasp the meaning of the story, or can deduce the meaning from the context or sensory cues. It might also be that a listener lacks all verbal understanding (McConkey, Morris, & Purcell, 1999; Nakken & Vlaskamp, 2007). In addition to their intellectual status, people with PIMD have significant physical and sensory impairments that impede their day-to-day competence (Evenhuis et al., 2001; Nakken & Vlaskamp, 2007). Due to these complex problems, the use of regular storytelling, where the focus is on comprehension (analysis and linguistic understanding), is restricted (Ten Brug et al., 2012). For this category of people, storytelling is not only about the content of the story or understanding the words, but also about listening to sounds and feeling

the words and atmosphere of the story. This can provoke a shiver, a release of tension or a feeling of happiness (Grove, 1998) (apprehension). For both apprehending as for comprehending the story, attention from the listener is essential (Munde, Vlaskamp, Ruijsenaars, & Nakken, 2009).

In order to include persons with PIMD in our storytelling culture, multiple methods of sensory storytelling were initiated by e.g. Grove and Park (1996), Heathcote (1991) and Jennings (1974). The first person to develop a multisensory approach to book reading for people with PIMD was Fuller (1990). She designed multi-sensory storytelling (MSST) as a method adjusted to the abilities and preferences of a person with PIMD. This storytelling method stimulates the preferred senses of the person with PIMD, in order to increase the salience of the activity (Mitchell & Le Pelley, 2010) and therefore makes stories accessible for the listener. These multi-sensory stories consist of six to sixteen sentences in total. For the listener, 6-8 pages are used, each page being supported by generally one sensory stimuli presented on a neutral background that is related to the sentences. Two stimuli may be used on one page, but only if it is appropriate (Lambe & Hogg, 2011). PAMIS, a voluntary third sector organisation from Dundee, Scotland have subsequently developed the method (Lambe & Hogg, 2011; Young et al., 2011) and established specific guidelines to facilitate listener attentiveness and ensure listener apprehension of the story. These guidelines state that

- (a) the story should be short, and little text should be used;
- (b) the text should furthermore be supported by multiple sensory stimuli;

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- (c) the stimuli should be shown against a neutral background to attract the listeners' attention;
- (d) Stimuli must be presented in an active way to give the person with PIMD the chance to explore and manipulate the stimulus;
- (e) repetition, with the precondition that the storyteller keeps him or herself to the storyline.

The attentiveness of the listener can be increased if the stimuli are offered in an active way (Green, Gardner, Canipe, & Reid, 1994). In addition, the duration of the story can also affect the listeners' attentiveness; the storyteller needs to keep in mind that it can take time for the attention of people with PIMD to be drawn to a stimulus. If they are not given this time, they fail to pay attention to a stimulus because it is removed too soon (Vlaskamp et al., 2007). Furthermore, repetition helps to familiarize the listener with the story and thus enables the listener to recognize and anticipate the story or part of it (Young et al., 2011). When a story is becoming familiar, events might get 'meaning' for the receiver, events with 'meaning' gain more attentiveness compared to seemingly random happenings (Pearce & Mackintosh, 2010). To conclude, the neutral background increases contrast and therefore the visibility of the stimulus, making it easier for the listener to focus on it and consequently reducing reaction time (Ten Brug et al., 2012).

To date it is unclear whether the above guidelines for MSST do increase the attention of a person with PIMD to the book and/or the storyteller during a reading session. The use of neutral backgrounds and active offering of stimuli is specifically aimed at increasing the attention towards the stimuli. Repetition and the duration of the story are expected

to increase the attention towards MSST as a whole. We do know that the guidelines are often followed inconsistently (Ten Brug et al., 2012), but we do not have information about the consequences of this. It is therefore important to explore whether these guidelines do increase the attentiveness of people with PIMD, which would thus support their successful implementation.

In order to understand to what extent the MSST guidelines positively influence the listeners' attention during an MSST reading session, we formulated the following research questions:

- (1) Does the amount of attention to MSST change when the story is repeated multiple times, and does the effect of repetition differ according to whether the storyteller uses the original text?
- (2) Is there a relationship between the way stimuli are offered (actively /passively, with/without neutral backgrounds) and the attention paid towards the stimuli and/or the storyteller.
- (3) Is there a relationship between the duration (in minutes) of the reading session and the attention paid to MSST?

## **3.2 Methods**

### **3.2.1 Participants**

In total, 45 storytellers volunteered to implement MSST within their care facilities. The storytellers came from both Belgium (Flanders,  $n = 18$ ) and the Netherlands ( $n = 27$ ) and worked at 29 different activity centres and/or group homes. Two of the storytellers were male and the average age of the storytellers was 36 years (SD: 10.2). Most of the

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storytellers worked as direct support professionals (53%) or speech therapists (20%), but teachers (6%), assistant support personnel (2%) and interns (6%) also participated in this research. Their experience with people with PIMD in general varied from two months to 31 years (mean: 9.6, SD: 8.1), and most had a vocational (44%) or higher vocational (40%) qualification. Two storytellers (5%) had an academic degree, and the details of five storytellers (11.1%) are missing.

All of the storytellers selected a person with PIMD that they knew well to create an MSST book for. As criteria for inclusion, the description of Nakken and Vlaskamp (2007) was used, meaning that all participants were diagnosed with a developmental age below 2 years, and had severe or profound motor disabilities. Twenty-three male (51.11%) and twenty-two female (48.89%) participants with PIMD were included in this study, thirty (66.67%) of the participants were < 18 years of age.

The average period the storyteller knew the person with PIMD was 3.6 years (SD: 4.2, range two months to 20 years). The gender of the person with PIMD was equally distributed (51% female).

### **3.2.2 Procedure**

The storytellers became familiar with MSST by participating in a six-hour workshop. During this workshop, theoretical information was given about MSST followed by a presentation on how to develop an MSST book. During this presentation the usefulness and rationale behind the guidelines (as mentioned in the introduction) was explained (Ten Brug et al., 2012). The storytellers then spent the rest of the

workshop writing their MSST books. The books were fully adjusted to the abilities of each individual person. As people with PIMD have high frequencies of sensory impairments, special attention was paid to the nature and type of the individuals' sensory impairments. Too, contextual preferences may influence the listeners' attentiveness, e.g. a quiet, secluded environment. To establish sensory and contextual abilities and preferences, a questionnaire was used (Inventory for tuning activities and situations to the abilities and preferences of children with profound intellectual and multiple disabilities (IPP)) (Tadema et al., 2005). To make sure the books were adjusted according to preferences and abilities of the person with PIMD, the text of the MSST books and the stimuli choices were perfected in collaboration between the storyteller and the researcher. The storytellers finished making their books after the workshop, but received the book covers, neutral backgrounds and some Velcro and elastic during the workshop. In our study all backgrounds were white, exceptions were possible when the storytellers selected white stimuli, but this was not the case. During the workshop, the storytellers were informed about the guidelines and their importance, but they were not corrected if they were deviating from these guidelines during storytelling.

### **3.2.3 Materials**

The MSST stories made by the storytellers were mostly (57.8%) about excursions the person with PIMD would make in his/her daily life (e.g. horseback riding or going for a walk). Eight stories (17.8%) focussed on a forthcoming event or activity (e.g. going to weekend-care, or getting a baby sister). Other stories were about (fantasy) activities (e.g. being a



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professional soccer player, or going to the disco). On average the storytellers used 14.04 sentences (range: 6-29, SD: 5.89) and 6.75 stimuli (range: 5-8, SD: 0.77) were used. Most stimuli were tactile (35.56%), auditory (26.96%) or visual (11.8%). Combinations of sensory stimuli occurred in 22.07%.

### **3.2.4 Data and Instruments**

Information concerning the demographic characteristics of the storytellers (e.g. age, gender and work experience) was collected with a short questionnaire, including the characteristics of the people with PIMD according to the internationally accepted description (Nakken & Vlaskamp, 2007), to ensure that all fell within the definition of the target group. As an aid by observing the listeners' behaviour, the storytellers gave the researcher specific details on the behaviour the listener showed when they are engaged with an object and/or a person. After these preparations, the storytellers were told to read the MSST book ten times to the person with PIMD. The first, fifth and tenth reading sessions were recorded on video. For this purpose one video recorder (JVC Everio camcorder) was used, the camera was positioned so that the whole storytelling situation was in focus. In total, 126 recordings were made, with nine recordings missing due to illness of the person with PIMD, holidays and one dropout from the research project. Eleven recordings could not be used because they were not clear enough for behavioural observations. The recordings were used to measure the amount of listener attention during the reading sessions.

*Independent variables.*

During the three recordings, verbal text used by the storytellers was scored on whether the storytellers deviated from the original story (yes/no). The guidelines regarding the repetition of the story were used to divide the storytellers into two groups. The first group (n =17) concerned the storytellers who kept to the storyline, and did not deviate, improvise or expand the story. These storytellers did encourage or prompt the individual to interact with the stimuli (eg. "do you like that, huh?" "Exciting!") or used minor textual deviations (e.g. "err..." or "ohh!!" ). The other group (n=28) consisted of the storytellers who deviated from the original text, for example by making adjustments in the text of the story when reading (e.g. instead of "we are driving with the car to the supermarket", the storyteller changed the text to "where are we going David? Do you know where we are going? We are going to the supermarket! With the nice blue car, it's a station, you like driving huh?").

Each stimulus presented was scored on two variables: (1) whether a stimulus was active or passive, and (2) whether or not a neutral background was used. Firstly, stimuli were categorized as being "active" or "passive". When the listener was given the time and (the physical) opportunity to explore the stimulus him/herself ( e.g. showing a mirror, putting is within arms-length in front of the listeners), the stimulus was offered "actively", if not it was scored 'passively'( e.g. perfume is sprayed on the listeners' neck, and immediately the perfume bottle is put away) The number of stimuli presented on a neutral background was counted.

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By dividing the number of neutral backgrounds and actively offered stimuli, by the total number of stimuli used in the MSST book, percentages were calculated.

The duration of the reading session was measured in seconds, and the average duration of the three recorded reading sessions was used in this research.

***Dependent variables.***

The degree of attention to the book or the storyteller was measured with an interval observation method (momentary time sampling). This involved stopping the recording every two seconds, and then observing the behaviour the listener showed at only that particular moment. While observing, the specific details about the listeners' behaviour provided by the storytellers, were used. So, every two seconds the attention of the listener was scored, and placed into one of the following three categories: (a) attention to the storyteller, for example looking, bending towards or pointing at the storyteller; (b) attention to the book/stimuli, for example looking, reaching or pointing at the book's box before a stimulus is presented or looking at or manipulating a stimulus; (c) other, for example attention is on something else in the room (e.g. the camera or another person), or the listener is paying no attention at all, and is for example showing withdrawn behaviour, or is dozing off. Options A and B were added together to calculate the total attention towards MSST as a whole.

The reading sessions differed in duration and consequently also in the number of observations. For each recording the number of observations in each category of attention was therefore divided by the

total number of observations in order to determine the proportion of attention each category received during a particular reading session.

### 3.2.5 Analysis

#### *Inter observer reliability.*

Twenty-three recordings (20% of the total number) were selected and scored on attentiveness by two researchers. The second observer randomly chose eight dyads which were used in order to calculate the interrater-reliability. Interrater-reliability was calculated using a Pearson's correlation coefficient. For three pairs of variables the interrater-reliability was given: (1) for the percentage of attention towards the book/stimuli, (2) the percentage of attentiveness towards the storyteller, and (3) the total attentiveness directed at MSST. After calculating the Pearson's correlation coefficient, we will examine whether there are notable differences in the amount of attention in the observations of both researchers.

The correlation between the observations of the two observers on the total amount of attentiveness towards MSST was  $r = .76$ . The correlation was slightly lower between the variables measuring the attentiveness directed at the book/stimuli ( $r = .72$ ) and attentiveness directed at the storyteller ( $r = .73$ ). When looking at the discrepancy in scores between the two observers, it is striking that the inter observer reliability of two dyads is far apart. From each dyad, three recordings are included in the calculation of the inter-rater reliability. When these six recordings are omitted, the correlation raises for the total attentiveness ( $r = .86$ ), the attentiveness towards the book/stimuli ( $r = .76$ ) and the attentiveness towards the storyteller ( $r = .79$ ).

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On average, the listeners were attentive to the storyteller or stimuli for 69% per cent of the reading session. The level of attentiveness varied per person (range: 25% - 100%, SD = 16%). Attention to MSST can be divided into attention to the storyteller and attention to the stimuli. Overall, more attention was paid to the stimuli (49%, SD = 18%) than to the storyteller (20%, SD = 18%).

### *Repetition.*

A repeated measures analysis was performed to see if the amount of attention paid to MSST changes if a story is repeated multiple times. As it is not possible to deal with missing data in a repeated measures analysis, the 20 missing recordings were replaced with a missing data analysis in the form of linear interpolation.

The percentage of attention to MSST as a whole (attention to the book and the storyteller) was used as a dependent variable, taking into account linear and quadratic effects. In addition to looking at a solely linear relationship, a quadratic relation was explored. This would make it possible to find not just an increase in attention but also an initial increase followed by a decrease or vice versa.

### *Use of the original text.*

The second part of the first question dealt with the distinction between the storytellers who did and the storytellers who did not use the original text, and what effect using the original text had on listener attention when the story was repeated. To answer this question, the grouping variable was added to the repeated measure analysis as a between-subject-factor. The percentage of attention to MSST as a whole was used as the dependent variable and again linear and quadratic effects

were taken into account. The group using the original text, and the group of storytellers who deviated from the original text were compared with each other. Also, the results of this analysis were compared with the results of the first research question in order to determine whether using the original text led to a different pattern of attention.

*Active offering of stimuli and white backgrounds.*

In order to answer the second question – regarding the presence of a linear relationship between attention to MSST and the percentage of white backgrounds and stimuli offered actively – the recordings of the reading sessions were used as individual observations ( $n = 115$ , instead of  $n = 45$ ). We used six Pearson's correlation coefficients to calculate the correlation between the proportion of attention paid to the storyteller, the book and MSST as a whole, the percentage of stimuli offered actively, and the percentage of white backgrounds used.

*Duration.*

The third and final research question was about the relationship between the duration of a reading session and the level of listener attention. For this analysis, the average percentage of attention, and the average reading session length was calculated for each listener. The listeners ( $n = 45$ ) were divided into three groups according to reading session duration: short (0<sup>th</sup> to the 33<sup>rd</sup> percentile), medium (34<sup>th</sup> to the 66<sup>th</sup> percentile) and long (67<sup>th</sup> to the 100<sup>th</sup> percentile). Descriptive statistics were reported for each group, time was reported in minutes and seconds. The difference in attention between the three groups was calculated using analysis of variance (ANOVA), with attention to MSST as a whole as the dependent variable. A post-hoc least significant difference analysis

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was executed to determine between which of the three groups a difference in attention could be found. We used an alpha level of .05 for all statistical tests.

## **3.3 Results**

### **3.3.1 Repetition**

In table 1 the amount of the listeners' attention towards the storyteller, the book/stimuli and to MSST as a whole are presented. The percentage of the reading session during which the listeners were paying attention to MSST (both storyteller and stimuli) increased from the first to the fifth reading sessions but decreased from the fifth to the tenth sessions (see Table 1).

The average attention paid to the MSST book was lowest during the first reading session, with an average of 65% and a 95 confidence interval between 60% and 70% (SD = 16.4). At the fifth reading session, the 95 confidence interval had a lower bound of 68% and an upper bound of 76%, and the average percentage of attentiveness to the 45 storytellers had risen to 72%, with a smaller standard deviation (SD = 14.6). The standard deviation (16.6) rose again from the fifth to the tenth sessions, and the average attention (71%) decreased. The 95 confidence interval of the tenth reading session ranged from 66% to 76%.

Table 1

*Descriptive statistics on attention to the storyteller, the book/stimuli and to MSST as a whole during the three recorded reading sessions.*

Reading session		Percentage attention			
		N	Minimum	Maximum	Mean (SD)
1st	MSST as a whole	45	.25	.96	.65 (.163)
	Storyteller	45	.00	.5	.19 (.136)
	Book/stimuli	45	.09	.80	.46 (.198)
5th	MSST as a whole	45	.41	1.00	.72 (.146)
	Storyteller	45	.01	.43	.20 (.102)
	Book/stimuli	45	.41	1.00	.72 (.146)
10th	MSST as a whole	45	.31	.96	.71 (.166)
	Storyteller	45	.00	.53	.21 (.124)
	Book/stimuli	45	.31	.96	.71 (.166)

The amount of attention paid to MSST consists of attention to the storyteller and to the book/the stimuli. The percentage of attention paid to the storyteller increased in the sample over the course of the reading sessions (from 19% to 20% to 21%), whereas the average attention to the book first rose (from 46% to 52%) and then decreased (to 50%) by the tenth reading session (see Figure 1).

The three measurements of attention to MSST were included as a factor in the repeated measures model. The results indicate a significant and positive linear relationship ( $F(1)=10.33$ ,  $p < .01$ ) and proof of a quadratic relationship ( $F(1)=4.46$ ,  $p < .05$ ).



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The linear relationship between repeating the MSST book and attention to MSST has a partial  $\eta^2$  of .19, and the quadratic relationship has a partial  $\eta^2$  of .09. This means the variation in attention can be explained by repetition.

### 3.3.2 Using the original text

The three measurements of attention to MSST were included as a factor in the repeated measures model, and whether the storyteller used the original text was added as a between subject factor. Figure 1 shows the amount of attention of the storytellers deviating from the original text, and of the storytellers using the original text. The same pattern of attention was found for both groups of storytellers during the three measurements.

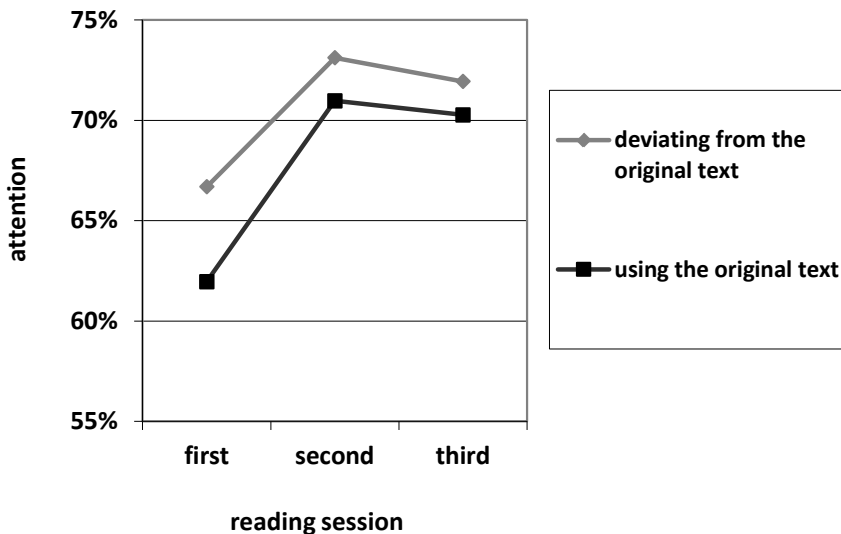


Figure 1. Difference in attention over the reading sessions, comparing storytellers who use the original text with those who do not.

The seventeen storytellers using the original text started with an average of 62% attention ( $SD=18.2$ ), and the listener attention rose by 9% to an average of 71% ( $SD=15$ ). The group of storytellers who never used the original text started with a higher level of attention (67%,  $SD = 15.2$ ) but the attention increase was smaller for this group compared with the other one (6%). The attention of the listeners in both groups decreased slightly (respectively 0.5% and 1%) from the fifth to the tenth reading sessions.

There is no interaction effect of the use of the original text for the linear ( $F(1)=.55, p > .05$ ) and the quadratic ( $F(1)=.07, p > .05$ ) relationship.

### **3.3.3 Offering stimuli**

To determine whether using white backgrounds and actively offering stimuli was related to the level of listener attention, the correlations were calculated between attention to MSST and the percentage of white backgrounds used and the percentage of stimuli offered actively. For this analysis 115 recordings of reading sessions from 45 different dyads were used. The percentage of attention to MSST in the sample correlated positively with the percentage of white backgrounds used ( $r = .14, p = .14$ ) and significantly and positive with the percentage of stimuli offered actively ( $r = .25, p < .01$ ). Of the total variance in attention to MSST, 6.3% can be explained by the percentage of stimuli offered actively (see Table 2).

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Table 2

*Correlations between the amount of listener attention and the way in which stimuli are presented by the storyteller.*

		Storyteller	Book/stimuli	MSST as a whole
% white backgrounds used	r	-.070	.173	.140
	p	.458	.066	.138
% stimuli offered actively	r	-.290	.415	.245
	p	.002	<.001	.009

If attention to MSST is divided into attention to the storyteller and attention to the book/stimuli, white backgrounds have no significant relationship with attention to the storyteller ( $r = -.07$ ,  $p = .46$ ) or to the book/stimuli ( $r = .17$ ,  $p = .07$ ). However, the percentage of actively offered stimuli correlated positively and significantly with the attention paid to the book ( $r = .42$ ,  $p < .001$ ,  $R^2 = 17\%$ ). In addition, a smaller, but significant negative correlation was found between actively offering the stimuli and attention to the storyteller ( $r = -.29$ ,  $p < .01$ ,  $R^2 = 8.5\%$ ).

### 3.3.4 Duration of the reading session

The last research question concerned the relationship between the duration of the readings session and the amount of listener attention. Two participants were excluded here because their reading sessions were more than three standard deviations above the mean and therefore not comparable with those of the other participants. The average reading time of the remaining 43 participants ranged from 1 min 38 s to 9 min 37 s (mean = 4 min 40 s, SD= 2 min 9 s). The 43 participants were divided

into three groups according to 'duration of the session': group I (n = 14) consisted of the listeners with short reading sessions (duration up to 3 min 5 s, range = 1 min 38 s - 3 min 5 s, mean = 2 min 27 s, SD = 29 s), group II (n = 15) the listeners with average-length reading sessions (duration of session 3 min 6 s - 5 min 25 s, range = 3 min 15 s – 5 min 26 s, mean = 4 min 23 s, SD = 45 s) and group III (n = 14) the listeners with relatively long sessions (over 5 min 26 s, range = 5 min 32 s – 9 min 37 s, mean = 6 min 13 s, SD = 1 min 17 s). The lowest percentage of attention was found in group I (with the shortest reading sessions (mean = 63%, SD = 14.4%)) and the highest attention scores (mean = 75%, SD = 12.8%) were found in group III (with the relatively long stories). The average group had a mean score of 73%, with a standard deviation of 15.1%.

Analysis of variance does not furnish enough proof to claim with 95% certainty that there is indeed a difference in attention to MSST between these three groups ( $F(2,40)=2.89$   $p = .067$ ). The significance on an  $\alpha = .10$  level did merit performing a LSD post-hoc analysis in which a significant difference ( $p < .05$ ) was found between the short and long sessions. The 95 confidence interval of the difference between these two groups has a minimum of 1.3% and a maximum of 21.9%. No difference was found between short and average-length stories ( $p = .07$ ) or between long and average-length stories ( $p = .64$ ).

Because the results of the analysis of variance showed indications of an linear relation between the average duration and the listeners' attentiveness, we plotted the average duration against the listeners attention to see if this supports the presumption of a linear relationship

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between the two variables (see figure 2). No significant relation was found between the average time, and the average listeners' attentiveness ( $F(1)=3.84, p < .057$ ).

### 3.4 Conclusion

In this research we looked at various guidelines for MSST and at whether adherence to them is related to increased listener attention to the MSST book and/or storyteller. The results show that the listener focused mainly on the book and that the storyteller received relatively little

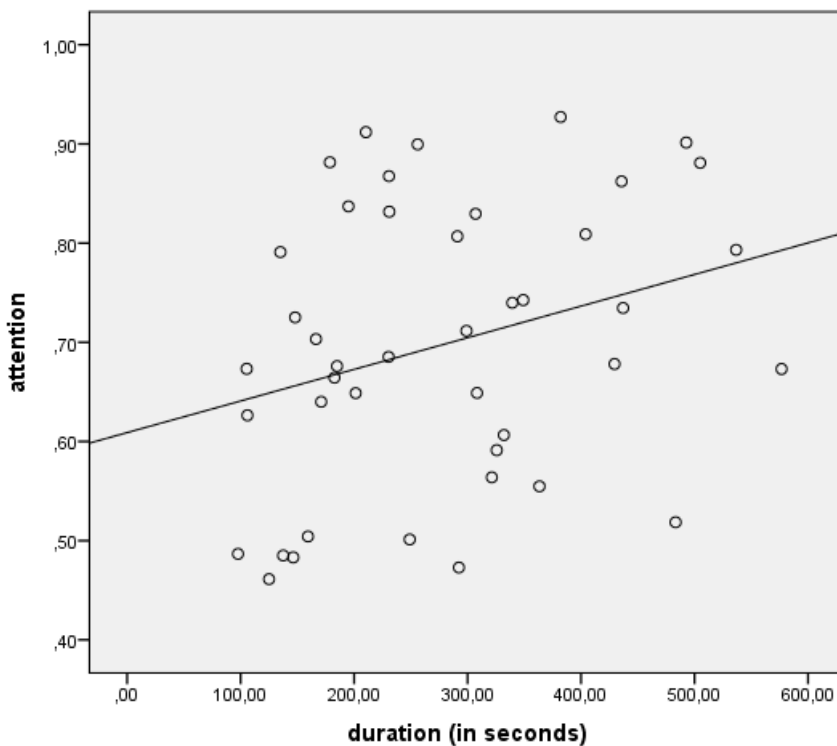


Figure 2. The amount of attention to MSST as a whole, plotted against the average duration of the reading sessions, with line of the best fit.

attention. The amount of attention paid to MSST was lowest during the first reading session, increased by the fifth session but then decreased by the tenth reading session. Whether or not the storyteller used the original text did not influence this pattern. The use of white backgrounds did not correlate with listener attention but the active offering of stimuli did: we found a small but significant correlation between the active offering of stimuli and listener attention to MSST. Specifically, the more stimuli offered actively, the more attention was paid to the book and the less attention paid to the storyteller. We also found a significant difference between stories with a long and short duration in terms of average attention, with the long stories attracting more listener attention.

### **3.5 Discussion**

This study has some methodological shortcomings. As this research has no true experimental design, no causal relationship between the elements of MSST (repetition, duration of the story, white backgrounds and active offering of stimuli) and listener attentiveness can be established. A final limitation concerns the characteristics of the people with PIMD, because there is a high prevalence of multiple sensory disabilities in this population group (Evenhuis et al., 2001). These sensory disabilities were not included as an intervening variable in this study, although a sensory impairment limits the possibilities for the storyteller but also the ability of the person with PIMD to show attentive reactions. However, because the MSST books were adjusted to the sensory preferences and abilities, known sensory impairments were accounted for. Difficulty in interpreting the behaviour of persons with PIMD makes reaching a high interrater-reliability often problematic, or

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even unrealistic (Mudford, Hogg & Roberts, 1997; Vlaskamp & Cuppen-Fontaine, 2007). Nevertheless, Pearson's correlations are ranging from .72 to .76, which can be described as sufficient. This result improves when two persons are removed from the calculation. For one person there was a large discrepancy (25.64%) in the average attentiveness observed between the two raters. For another person, the observations of the two raters correlated negative ( $r = -.52$ ). Without the recordings of these two persons in the analysis, the inter-rater reliability increases to 'good'; ranging from .76 to .86. Finally, not all aspects of MSST were analysed in this study; linguistic aspects like the structure of the story, the use of a climax in the story, or the language used in the stories could also contribute to the attentiveness of the listener. In addition, we have chosen to study a specific type of multi-sensory stories, in which stories are custom made and individually read. There are a variety of multi-sensory telling approaches with different aims. Examples are the sensitive stories to make people with PIMD familiar with difficult subjects (Young et al., 2011), sensory fairy tales aimed to introduce persons with PIMD in our storytelling culture (Fornefeld, 2013), or sensory stories told in groups aimed at improving communication and finding common interests (Lyons & Mundy-Taylor, 2012). The type of MSST used in this study should be kept in mind when interpreting the results.

Regardless of the limitations mentioned above, this research shows that storytellers are able to hold the listeners' attention for the greater part of the reading session. The listener pays attention the first time the MSST book is read, and this is mainly to the book. As the stimuli in the book were handpicked for each listener, we therefore expect the stimuli

to have a high salience and that listeners will react strongly with an oriented response (Mitchell & Le Pelley, 2010).

With MSST, the listeners' attention increases if he or she hears a story multiple times. The stimuli offered will probably become more relevant for the listener due to their predictive value and are therefore worthy to be aware of (Mitchell & Le Pelley, 2010). The decrease in attention between the fifth and the tenth reading sessions could be because the MSST book becomes too predictable (Mitchell & Le Pelley, 2010; Stafford, 2005) and the listeners' attention is consequently lost. Since the same stimuli were used over the whole period, it could be that the stimuli lost their appeal for the listener. Young et al. (2011) shows that the development of engagement varies between different listeners; there might also be a difference in the development of attention. More detailed analyses could provide information about the listeners' attentiveness during and over the storytelling sessions.

Whether the storyteller uses the original text has no influence on the pattern in listener attention, in either a positive (being more attentive because the text is predictive) or a negative sense (being more attentive because a change in text makes it more exciting). If we look at the presentation of the stimuli, the lack of a linear relationship between the use of white backgrounds and listener attention is noticeable. The white backgrounds were expected to increase the response and therefore optimize listener attentiveness during storytelling (Pasto & Burack, 1997). It is possible that an increase in the speed at which the listener focusses his/her attention, is not automatically an increase total amount of attention. Further detailed analysis focusing on the response to the



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stimuli is necessary to provide more information about the effect of the use of the white backgrounds.

Whereas the use of white backgrounds is not related to the amount of attention, the correlation between the active offering of stimuli and attention to the stimuli is considered moderate (Cohen, 1988); the way stimuli are presented has a substantial relationship with the amount of attention paid to them. This attention is only partly at the expense of attention to the storyteller. Because offering stimuli actively results in more attention for the stimulus, but also in continued attention towards the storyteller, we can wonder if storytelling might culminate in playing. This seems to go together with the fact that the majority of the storytellers deviates from the storyline.

The final research question concerned the relationship between the duration of the story and the amount of listener attention. The results show that the shortest stories (with an average length of fewer than three minutes) received the least amount of listener attention. This can be explained because people with PIMD need ample time to react to a stimulus (Vlaskamp et al., 2007), so a certain amount of time to react to a stimulus has to be taken into account when reading a story. Although this was highlighted during the workshop in which storytellers participated, a third of the stories took less than three minutes to read. This might be caused by insufficient training, or could be because the storytellers are accustomed to read regular stories, and read the MSST books in a comparable pace. It is possible that during the stories with a short duration the listeners did not receive enough time to become attentive, which would thus explain the lower level of attention. Another

explanation for more attention during longer stories could be that more stimuli are offered actively during the stories with a long duration. However, due to the small number of participants, it was decided to not add this extra variable in the statistical model. Furthermore, analysis regarding a difference in active offered stimuli between the three groups defined by the duration of the story (using an ANOVA), did not show a significant difference ( $F(2,42)=2.86, p > .05$ ). Within this research, there were two stories with a long duration, especially when compared with the other recordings. These stories were omitted because it is a characteristic of MSST to be a relatively short activity that can be carried out in between other activities.

The importance of regular evaluations of interventions is broadly accepted, especially when dealing with a target group with pervasive support needs (Poppes, Van der Putten, & Vlaskamp, 2011; Vlaskamp & Nakken, 2008). We would underline this importance when it comes to MSST because, for example, there is no guarantee that a stimulus that 'worked' two months ago is still effective. Besides possible changes in stimuli preferences, many other factors also influence the effectiveness of MSST. One such factor is that regardless of how guidelines are presented it is often difficult to follow them in practice (Ten Brug et al., 2012). An explanation for these deviations from the guidelines might be that the storytellers wrote the story themselves, and felt free to adjust 'their' story over time, also if another way of instructing the storytellers contributes to a better use of the guidelines. We do also know direct support persons (DSP) are only moderately sensitive towards the listener during storytelling (Penne et al., 2012), and DSP may therefore miss subtle signals indicating, for example, that a person is not done manipulating a

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stimulus. Therefore, every now and then it is necessary to critically evaluate the content of the story, the stimuli used and the way the story is read. In particular, if listener attention drops one should evaluate the situation by posing questions like: are the stimuli still adequate or could we think of better ones? Is the reading time sufficient for the listener to engage in the story? Is the sentence length and language used appropriate or does this cause the listener to lose focus? And does the listener have the time and opportunity to manipulate the stimuli?

Telling a multi-sensory story is indeed a suitable activity for people with PIMD. MSST thus includes people with PIMD in our storytelling culture, which is not only an enjoyable and stimulating experience; it is also a unique human experience (Ware 1994). The persons involved in this study all have ample attention towards their personal story; they enjoy their story and the accompanying stimuli. But their attention also provides opportunities for development; listeners can get acquainted with new stimuli, and they can become familiar with the course of their story. And, if a listener knows his/her story, it becomes possible to recognize or anticipate parts of it. The influence of the guidelines on attention also became clearer. Repeating the same story, however, is not enough to keep or increase the attention span of the listener. This study has shown that the storyteller also needs to be attentive when reading the story, e.g. adhering to the guidelines and being aware of changes in the listeners' attention. This means giving the listener space to actively investigate the stimuli, even when you are telling the same story one more time.