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# A good read

ten Brug, Annet

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# Chapter 7 Making a difference?

A comparison between multi-sensory and regular storytelling for persons with profound intellectual and multiple disabilities.

Under revision as:
Ten Brug, A., Van der Putten, A., Penne, A., Maes, B., & Vlaskamp, C. Making a difference? A comparison between multi-sensory and regular storytelling for persons with profound intellectual and multiple disabilities.

## 7.1 Introduction

Persons with profound intellectual and multiple disabilities (PIMD) have profound intellectual disabilities in combination with severe or profound motor and/or sensory disabilities (Nakken & Vlaskamp, 2007). Due to these disabilities, storytelling is often considered an unsuitable activity for this target group (Lyons & Mundy-Taylor, 2012). MSST was the brainchild of Park and Fuller (Fuller, 1990; Park, 1998), who considered it their mission to include persons with PIMD in our storytelling culture, and it was further developed by the Scottish volunteer organization PAMIS (Lambe & Hogg, 2011). Multi-sensory stories are individualized stories in which sensory stimuli support the verbal text. The sentences should be as short as possible and the stimuli provided should target different senses. The stimuli are selected according to the content of the sentence and the assumed preferences and abilities of the individual with PIMD. The use of individually adapted stimuli in MSST books is a crucial aspect of adjusting the book to the listeners' needs: whereas regular books activate the auditory and possibly the visual sense, MSST books use stimuli that can activate all the senses. This makes stories accessible to people who cannot be captivated by the voice of the storyteller and pictures alone. The aim of an MSST book is not necessarily for the person with PIMD to fully comprehend the story but rather to apprehend its atmosphere (Grove, 1998).

MSST was implemented in England, Scotland and the Netherlands without scientific evidence to back it up. However, the body of research into the use of MSST has grown in the last few years (Grove & Park, 1996; Penne et al., 2012; Preece & Zhao, 2014; Ten Brug et al., accepted;

Ten Brug, Van der Putten, & Vlaskamp, 2013; Ten Brug et al., 2012; Young et al., 2011). This research has shown promising results, and the listeners have been found to be engaged (Young et al., 2011), attentive (Ten Brug et al., accepted) and alert (Ten Brug, Munde, Van der Putten, & Vlaskamp, submitted) during MSST sessions. Research has also shown that the found effects on described variables, do relate to the different components of the storytelling; such as the repetition of the story (Ten Brug et al., accepted; Ten Brug et al., submitted; Young et al., 2011) and the way stimuli are presented by the storyteller (in an active either passive way) (Ten Brug et al., accepted; Ten Brug et al., submitted).

If persons with PIMD are to apprehend the story, they need to pay attention. However, it is not only the amount of attention that is important: since an MSST story is read repeatedly, the change in attention over the course of the repeated storytelling sessions, and differences here between the regular books and MSST books, is also relevant. A person might be attentive the first time the story is read, but become less and less attentive as the story is read more often.

A higher amount of attention is assumed when the storyteller, story or stimuli have an high salience; stimuli with ah high salience stand out from their environment (Mitchell & Le Pelley, 2010). The degree to which the story captures the listeners' attention might play a part in the level of attention over the course of the repeated storytelling sessions; an attentive listener might learn to recognize parts of the story and so ascribe meaning to the story. This might lead to a further increase in attention. However, once the stimulus has been fully explored and the

story becomes too predictable, the listeners' attention to the stimuli might decrease (Mackintosh, 1975; Pearce & Hall, 1980; Pearce & Mackintosh, 2010). As the amount of attention paid to the book might affect the listeners' level of attention over the course of the storytelling sessions, there could be differences between the MSST and the regular books in relation to the listeners' attention over the course of the sessions.

A listeners' level of attention to the story and/or storyteller might also relate to the individual character of MSST, which provides ample opportunity for one-on-one interaction between the storyteller and the listener. This might even be the decisive factor in the amount of listener attention both in the individual sessions and over the course of these sessions. If this is true, existing regular books could be used for listeners with PIMD instead of custom MSST books that are adjusted to the abilities and preferences of an individual, which is a time-consuming process. In order to understand the benefits of MSST books when compared with regular ones that are not adjusted to the listeners' preferences and abilities and do not contain multi-sensory stimuli, we compared listener attentiveness during these two storytelling conditions. We assumed that the individualized and multi-sensory character of MSST would cause a higher level of listener attentiveness towards the MSST books than to regular books. Furthermore, we hypothesized that the attention over the course of the storytelling sessions would differ between these two storytelling conditions.

## 7.2 Material and methods

### 7.2.1 Participants

Seventy-six storytellers volunteered to participate in this research. They came from Belgium (Flanders, n = 18) and the Netherlands (n = 58) and worked in 30 different settings and locations: activity centres, schools and residential facilities. The age of the storytellers varied between 20 and 65 (mean: 36.9, SD: 10.71). Most worked as direct support professionals (61.8%) or speech therapists (14.5%), but others were teachers (3.9%), assistant support staff (2.6%) or interns (5.3%). Information about the position of nine participants was missing. Most of the storytellers had a vocational (39.5%) or higher vocational (39.5%) qualification. Two (2.6%) had an academic degree and one had only completed secondary education (1.3%). The remaining storytellers did not provide details on their education.

All storytellers selected a person with PIMD whom they knew well and to whom they would read a book. Nakken and Vlaskamp's (2007) description was used as the criteria for inclusion, meaning that all participants were diagnosed with a developmental age below 2 years, and had severe or profound motor disabilities. Forty-five (59.2%) were above 18 years of age. The average length of time the storyteller had known the person with PIMD was 4.2 years (SD: 5.01).

The storytellers were divided into two groups based on order of registration: the first storytellers to sign up for the research were assigned to the MSST group. Once this group had reached 50, it was considered full; for a variety of reasons, such as lack of time and lack of informed

consent from parents, five of these storytellers ended up not participating. The remaining storytellers were assigned to the regular storytelling group.

The two groups were compared on the storyteller's experience (with both the listener and persons with PIMD in general), position and level of education as well as on the age group of the person with PIMD. There was no significant difference in the distribution of the listeners' age group between the storytelling conditions (Chi (1) = 2.07, p = .15). In an independent sample t-test, no significant difference was found between experience working with the listener ($t(63) = .967$, $p > .05$) nor with persons with PIMD in general ($t(65) = .695$, $p > .05$). A Fisher's exact test was used to compare the two groups of storytellers on their position and educational level; no statistically significant difference was found in educational level ($p = .47$), but there was a significant difference between the groups in the storytellers' position ($p = .043$). The group that read the regular books contained more direct support persons than the group that read the MSST books (83.3% compared to 59.5%), whereas the MSST group comprised more speech therapist, teachers and assistants.

Table 1

*Comparison of the MSST and the regular storytelling condition in terms of listener and storyteller characteristics*

| | Storyteller | | | | | | | | | | | | | Listener (N = 76) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | Age (N = 76) | Experience with persons with PIMD (years) (N = 67) | Experience with the listener (years) (N = 65) | Education (%) (N = 63) | | | | Vocation (%) (N = 67) | | | | | Female (n; %) | Child (n; %) |
| | | | | | Vocational | Higher vocational | University | Other | Direct support person | Speech therapist | Teacher | Intern | Assistant | | |
| **MSST** | 45 | 35.8 | 9.2 | 3.6 | 45.8 | 50.0 | - | 4.2 | 56.4 | 25.6 | 7.7 | 7.7 | 2.6 | 23; 51.1 | 30; 66.7 |
| **Regular books** | 31 | 38.9 | 12.8 | 5.0 | 48.7 | 46.2 | 5.1 | - | 89.3 | 3.6 | - | 3.6 | 3.6 | 7; 26.9 | 15; 48.4 |
| **Total** | 76 | 36.9 | 10.7 | 4.2 | 39.5 | 39.5 | 2.6 | 1.3 | 61.8 | 14.5 | 3.9 | 5.3 | 2.6 | 30; 42.3 | 45; 59.2 |

Grey areas differ significantly between the MSST and the regular storytelling condition ($p > .05$)

## 7.2.2 Intervention

MSST involves a short story that is read aloud and supported by multiple sensory stimuli (Fuller, 1990; Lambe & Hogg, 2011; Ten Brug et al., 2012). The subject and text of the story together with the stimuli should be fully attuned to the preferences and abilities of the person with PIMD. According to the general guidelines for MSST, the stories should

consist of six to sixteen short sentences, which are supported by six to eight stimuli. Every one or two sentences are linked to one stimulus.

Each book contains instructions for the storyteller explaining the ideal setting (e.g. environmental noise, size of the room) and the best way to tell the story (e.g. tone of voice, distance to the listener), also providing information about the listener (e.g. ideal posture and the time they need to focus). Velcro or elastic bands are used to attach the stimuli to large neutral boards, which make the stimuli more visible. After this initial presentation, the stimuli are removed from these boards, and the listener is given the opportunity to manipulate them. MSST books should be read multiple times in exactly the same way (Ten Brug et al., accepted).

To determine which stimuli can be used in which way, the storytellers used a checklist , containing questions on functional abilities (visual, auditory, tactual, olfactory and motor abilities), and the person's preferred sensory channel, and the preferred where, when and how of stimuli presented.

The storytellers who read the 'regular' book needed to select a book that was new to the person with PIMD. It also needed to suit the preferences and abilities of this person: an example would be a new book from a series of familiar books such as the Miffy series. The storytellers who read the regular books did not fill in a structured questionnaire and did not receive personalized instructions before telling the story. All storytellers were asked to choose the setting and time for the storytelling that they believed best for the person with PIMD.

### 7.2.3 Procedure

As already indicated, the storytellers were divided into two groups based on order of registration. The first group read an MSST book and the second group a regular book.

The first group of storytellers (n = 45) were familiarized with MSST in a six-hour workshop. The workshop included theoretical information about MSST and a presentation on how to develop an MSST book, explaining the rationale behind the guidelines (as mentioned in the introduction) (Ten Brug et al., 2012). The storytellers then spent the rest of the workshop writing their MSST books, in which they fully adapted the books to the abilities of each individual. As people with PIMD have high frequencies of sensory impairments, they also paid special attention to these. Furthermore, as contextual preferences such as a quiet, secluded environment may influence listener attentiveness, they also took these into account. They used a structured questionnaire to establish sensory and contextual abilities and preferences, and to ensure the books were adjusted to preferences and abilities of the person with PIMD. The researcher helped the storytellers perfect the text and stimuli. The storytellers finished their books after the workshop, but were given the book covers, neutral backgrounds, Velcro and elastic during the workshop. In our study, all backgrounds were white; although, had a storyteller selected white stimuli, an exception would have been possible. Although the storytellers were informed of the guidelines and their importance, they were not corrected if they deviated from these in their stories.

The second group of storytellers was asked to select a regular book for the person with PIMD. This needed to be a book that could be bought in a shop or borrowed from the library rather than a self-penned one. The storytellers were asked to select books they thought the listeners would enjoy, but not books the listeners were familiar with and would recognize, as this would influence their attentiveness. The MSST books were also new to the listeners in the MSST group. The storytellers were told that the story should preferably take between 2 and 15 minutes, which was comparable to the duration of an MSST book, but that it could be shorter or longer. The storytellers were free to select any kind of story: a chapter of a book, a whole book, one or multiple short stories or a picture book. They could also adjust the reading conditions (e.g. time and place) to the preferences and abilities of the listener.

### 7.2.4 Data and Instruments

Information on the demographic characteristics of the storytellers (e.g. age, gender and work experience) were collected using a short questionnaire, as was information on the characteristics of the people with PIMD, according to the internationally accepted description (Nakken & Vlaskamp, 2007). This was to ensure that all fell within the definition of the target group. As an aid to observing the listeners' behaviour, the storytellers were asked to give the researcher specific details on the behaviour the listener exhibited when engaged with an object and/or a person. The storytellers reported on the behaviours the listeners would normally show when engaged into the story (e.g. 'leans forwards', 'makes eye contact', 'reach to the stimulus'). These details on

individual behaviour of the person with PIMD was provided by the storyteller to the researcher. After these preparations, the storytellers from both groups were told to read the MSST or the regular book ten times during a 5 week period to the person with PIMD. The first, fifth and tenth reading sessions were recorded on video. In total, 216 recordings were made, with 12 recordings missing due to illness of the person with PIMD, holidays and one dropout from the research project. The duration in seconds of the stories was measured.

The degree of attention paid to the book and/or the stimuli or to the storyteller was measured with an interval observation method (momentary time sampling). This involved stopping the recording every two seconds and observing the listeners' behaviour at that particular moment. The details provided by the storytellers on the listeners' behaviour were used in these observations. The listeners' attention was scored every two seconds and assigned to one of the following three categories: (a) attention paid to the storyteller, for example looking, bending towards or pointing at the storyteller; (b) attention paid to the book and/or 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 exhibiting withdrawn behaviour or dozing off. An earlier study calculated the inter-observer reliability for attentiveness during storytelling sessions and found it to be satisfactory (Ten Brug et al., accepted).

### 7.2.5 Analysis

The average duration in seconds was calculated for each storytelling dyad by adding up the duration of the storytelling sessions and dividing this by the number of storytelling sessions. An independent sample t-test was used to compare the average duration of the MSST stories to the average duration of the regular stories.

The total attention paid to the storytelling as a whole was calculated by adding up the amount of attention paid to the storyteller and to the book and/or stimuli. As the reading sessions differed in duration and consequently in number of observations, the number of observations in each category of attention for each recording was therefore divided by the total number of observations in order to determine the proportion of attention paid to a category during a particular reading session. Descriptive statistics were used to report attentiveness to the book and/or stimuli, to the storyteller and to the storytelling as a whole.

Repeated measures were performed to analyse whether the amount of attention paid to the storyteller and book/stimuli was related to the storytelling condition (MSST or regular storytelling), repetition or interaction between these factors. As it is not possible to deal with missing data in a repeated measures analysis, we chose to perform a missing data analysis. Little's MCAR test was not significant ($chi2(12) = 10.33$, $p = .57$), meaning that the missing data was probably completely random. A missing data analysis in the form of multiple interpolation replaced the missing recordings. Five imputations were generated for the six variables describing listener attention (for each measurement

attention to the book/stimuli and attention to the storyteller). The minimum and maximum values found in the dataset were maintained, and the condition (MSST or general reading) was included as a predictive variable.

The storytelling condition was included as a between-subject factor in the repeated measure analysis. The three measurements (the first, fifth and tenth storytelling sessions) were included as the factor. The percentage of attention paid to the book and/or the stimuli was used as the dependent variable in the first repeated-measure analysis, and attention paid to the storyteller in the second analysis. The overall difference between the two storytelling conditions (MSST and regular storytelling) with respect to attention paid to the book and/or the stimuli and storyteller was then analysed, and the effect of time was calculated to explore whether repetition related to overall attention in the two storytelling conditions. This was followed by an analysis of whether the storytelling condition influenced the effect of repetition.

The percentage of attention paid to storytelling as a whole (attention to the book and/or stimuli and to the storyteller) was used as a dependent variable, taking into account linear and quadratic effects. In addition to looking at a solely linear relationship, we also explored a quadratic relationship. 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.

## 7.3 Results

The average duration of a storytelling session was 304.42 seconds (SD = 193.32). The average MSST story was longer (mean = 321.05, SD = 228.66) than an average regular story (mean = 280.28, SD = 125.40), but this difference was not statistically significant ($t(74) = 1.755$, $p = .189$). Two dyads in the MSST condition read relatively long stories: these had an average duration of 1163 and 1226 seconds, while the third longest duration was 599 seconds. If these two dyads were excluded, the average duration of the MSST stories was 280.43 seconds (SD = 129.27). These two dyads were thus omitted from the analysis.

Table 1 shows the attentiveness towards the storyteller and the book and/or stimulus in the two groups: MSST books and regular books. The average amount of attention directed at the MSST as a whole was 64.42%, 72.92% and 71.60% for the first, fifth and tenth reading sessions respectively. For regular storytelling, the percentages of attention directed at the activity were 42.94%, 41.79% and 43.78% (see Table 2).

The three measurements of attention paid to the storytelling were included as a factor in the repeated-measures model, and whether an MSST or regular book was used was added as a between-subject factor. Figure 1 is a graph showing the amount of attention paid to the MSST and regular storytelling.

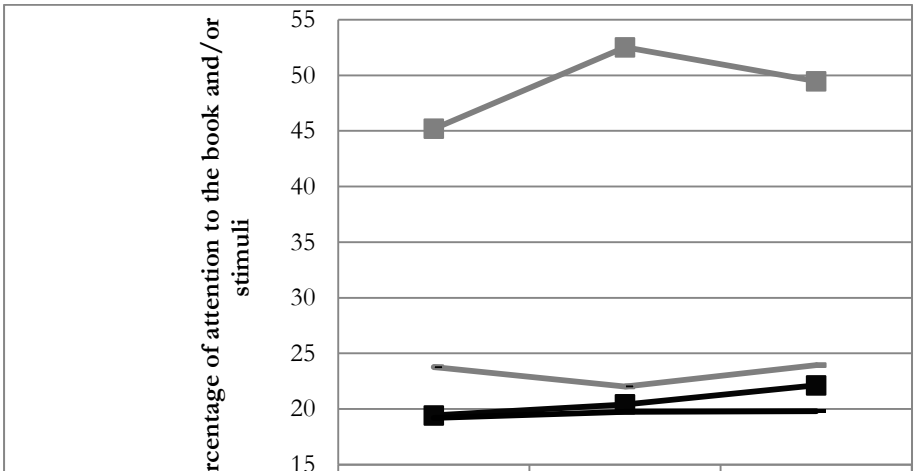
The amount of attention paid to the book/stimuli was measured and a repeated-measure analysis performed. A significant main effect was found for the attention paid to the book/stimuli on the MSST and the

regular stories. This showed that the listeners paid more attention to the book/stimuli when being read MSST books than when being read

Table 2

*Attentiveness to the storyteller, the book/stimuli and the storytelling as a whole for the storytellers using MSST and the storytellers reading regular books*

| | | Attentiveness | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | MSST (n = 43) | | | regular storytelling (n = 31) | | |
| | | | Mean (%) | SD (%) | Range (%) | Mean (%) | SD (%) | Range (%) |
| sessions | | Storyteller | 19.26 | 13.54 | 0–50 | 19.19 | 12.95 | 1–54 |
| | First | Book/stimuli | 45.19 | 19.42 | 9–80 | 23.77 | 21.87 | 0–97 |
| | | Whole activity | 64.42 | 16.51 | 25–96 | 42.94 | 24.54 | 3–97 |
| | | Storyteller | 20.41 | 10.42 | 1–43 | 19.75 | 14.59 | 1–51 |
| | Fifth | Book/stimuli | 52.52 | 18.53 | 17–83 | 22.03 | 21.40 | 0–86 |
| | | Whole activity | 72.92 | 14.51 | 41–100 | 41.79 | 26.35 | 3–88 |
| | | Storyteller | 22.12 | 12.22 | 2–53 | 19.81 | 14.69 | 0–65 |
| | Tenth | Book/stimuli | 49.46 | 17.22 | 15–82 | 23.95 | 23.62 | 0–93 |
| | | Whole activity | 71.60 | 16.88 | 31–96 | 43.78 | 26.73 | 4–97 |




| | First session | Fifth session | Tenth session |
|---|---|---|---|
| MSST: Book/stimuli | 45,19 | 52,52 | 49,46 |
| Regular: Book/stimuli | 23,77 | 22,03 | 23,95 |
| MSST: storyteller | 19,42 | 20,41 | 22,12 |
| Regular: storyteller | 19,19 | 19,75 | 19,81 |

*Figure 1.* Attentiveness to the book and/or stimuli and the storyteller during the three reading sessions of regular and multi-sensory storytelling

regular books ($F_{1;72} = 33.628$, $p < .001$). There was no evidence for either group that the attention paid to the book/stimuli changed as the book was read more often ($F_{2;144} = 2.151$, $p = 0.12$). There was, however, a significant interaction effect: as the books were read more often, the attention paid differed between regular books and MSST books ($F_{2;144} = 5.093$, $p < .01$). The changes in attention between the first two recordings and between the last two recordings differed for the two reading conditions ($F_{1;72} = 10.617$, $p < .01$). The attention aimed at a regular book over the three storytelling sessions seemed to be constant, with a small relapse during the fifth reading session. The attention aimed at the stimuli of MSST books first raised and then decreased slightly (see figure

1). There was no evidence of the attention being linear over the course of the sessions ($F_{1;72}$ = 1.671, p = .20).

The second repeated-measure analysis was performed with attention paid to the storyteller as the dependent variable. No difference was found in attention paid to the storyteller between regular books and MSST books ($F_{1;72}$ = 0.159, p = 0.691), nor was there proof of an effect of time, meaning that the attention paid to the storyteller did not change significantly over the reading sessions ($F_{2;144}$ = 0.681, p = 0.508). Finally, no interaction effect was found, meaning that the attention paid to the storyteller over the course of the sessions did not differ between the two reading conditions ($F_{2;144}$ = 0.303, p = 0.739).

## 7.4 Conclusions

The aim of this study was to compare the amount of attention persons with PIMD paid to the book, the stimuli and the storyteller when being read MSST or regular books. The attention of the listener was divided into attention paid to the storyteller and attention paid to the book and/or stimuli. Those who were read MSST stories did pay significantly more attention to the book and/or stimuli (between 45.19% and 52.52%) than those who were read regular stories (between 23.62% and 21.40%). There was only a small difference in the attention paid to the storyteller, but this was not significant. When the story was repeated, a difference was found between the regular and MSST conditions in the attention paid to the book and/or stimuli over the course of the sessions: the change in attention between the first and fifth, and fifth and tenth reading sessions differed between the MSST condition and the regular

books; the attention during regular books remained constant over the reading sessions, while the attention aimed at the MSST books and/or stimuli peaked during the fifth session.

## 7.5 Discussion

This study has some limitations. We chose a control group design. A downside of this design might be that there are differences between the persons in the MSST condition and the persons in the regular condition because of the diversity in the target group people with PIMD (Nakken & Vlaskamp, 2007). In order to obviate this problem, we could have chosen another design and instructed one group of dyads to read a regular book first and then an MSST book. However, we deliberately chose not to use this design because the listeners and storytellers would then become accustomed to reading together, and the first sessions could thus affect the listeners' attentiveness in later sessions.

Another concern is the reliability of the behavioural observations. Persons with PIMD have minimal communication skills and their behaviour is often idiosyncratic, which makes it difficult to interpret (Grove et al., 1999; Hostyn & Maes, 2009; Petry & Maes, 2006). In addition, the use of video observations, which meant that only visible behaviour could be taken into account, affected the interpretation of behaviour. For example, if the listener was alert, but staring at the door and apparently not attentive, this behaviour was coded as 'not being attentive'. It is possible, however, that the listener was focusing on the storyteller's voice and the attentiveness was thus underestimated. However, an earlier study found the observations of attention to be

moderately reliable (Ten Brug et al., accepted), and the underestimation of attentive behaviour applies to both the MSST and the regular reading condition and therefore does not affect the comparison of the conditions.

If the listener was attentive to the book, it was not taken into account whether this was negative (for example trying to close the book) or positive (looking carefully at a stimulus or a picture) attention. In another study, discontented behaviour was only observed a few times during MSST sessions (Ten Brug et al., submitted), but it is unknown how often discontented behaviour occurs in regular reading sessions. It would be interesting to include data on listener alertness and wellbeing in future research. Penne et al. (2012) suggested that the relationship between the storyteller's interactive style and the wellbeing and involvement of the listener should be explored. This could be supplemented by other data, for example on the role of repetition in the level of wellbeing and involvement. We could also examine the difference in level of wellbeing and involvement between MSST and regular books.

A final concern relates to the difference in preparation of the MSST and the regular group. In the regular storytelling condition, the storytellers did not use a structured questionnaire the to formulate instructions on the ideal storytelling circumstances. The reason for this was to prevent the regular condition from becoming too complex and time-consuming. This difference may have caused less favourable reading circumstances for the regular books than for the MSST books, which could have led to less attention being paid to the regular books.

However, the storytellers in the regular condition did determine the reading conditions, albeit without the use of a structured questionnaire the. In an earlier study, we found that knowledge of the ideal reading circumstances tended to change over the reading sessions (Ten Brug et al., 2013). The instructions compiled before the MSST books were read may also have required improvement, and the MSST condition may therefore not have differed greatly from the regular condition.

Despite these methodological issues, the results of this study supplement our current knowledge of the effectiveness of MSST as an intervention for persons with PIMD. The difference in listener attention paid to the book and/or stimuli between the two reading conditions could be expected because the stimuli in MSST stories are selected to fit the preferences and abilities of the person with PIMD. It is reasonable to expect that stimuli selected with care for a person with PIMD are highly salient for that particular person (Vlaskamp et al., 2007) and will capture more attention than a regular book. It is assumed that learning will be quicker with more salient stimuli (Kamin & Schaub, 1963; Mackintosh, 1975) and that MSST will therefore give the listener more opportunity to learn about the book and hence apprehend the story.

As relevant stimuli tend to receive more attention in repetition (Mackintosh, 1975), the listeners' attention might increase as he or she becomes familiar with the book. This is true for both MSST and regular books. However, MSST books receive more overall attention and are therefore assumed to have a higher 'associability' compared to regular stories, meaning that they can easily be learned about (Mitchell, Le

Pelley, 2010). The listeners are expected to become more easily familiar with the storyand the stimuli will more quickly become relevant to them. The observed increase in attention between the first and fifth reading sessions of the MSST books, which was not observed with the regular stories, can be explained by this effect of repetition.

Later on, the listener may become habituated to the book and the book become predictable, which could cause a decrease in attention (Pearce & Mackintosh, 2010). This corresponds with the decrease found between the fifth and tenth sessions of the MSST condition, whereas a slight increase in attention was found between these two measurements in the regular reading conditions. As there was no significant difference in attention paid to the storyteller, we might assume that the higher degree of attention paid to the stimuli of the MSST book did not divert the listeners' attention from the storyteller.

Storytelling is an important part of human culture, from which persons with PIMD tend to be excluded. Compared with regular books, MSST books increase the listeners' attentiveness to the book and/or stimuli. Further research must focus on which aspect or aspects of MSST are the decisive factor in the effectiveness of MSST: the use of sensory stimuli, the custom made character, the adapted reading condition, or a combination of aspects. For now, we can conclude that if a story is adapted to the preferences and abilities of a person with PIMD and includes sensory stimuli handpicked for this listener, they will have more opportunity to apprehend the story and thus be included in our storytelling culture