

AperTO - Archivio Istituzionale Open Access dell'Università di Torino

## Are story retelling and story generation connected to reading skills? Evidence from Finnish

### **This is the author's manuscript**

*Original Citation:*

*Availability:*

This version is available <http://hdl.handle.net/2318/1681741> since 2018-11-21T14:41:09Z

*Published version:*

DOI:10.1177/0265659018780960

*Terms of use:*

Open Access

Anyone can freely access the full text of works made available as "Open Access". Works made available under a Creative Commons license can be used according to the terms and conditions of said license. Use of all other works requires consent of the right holder (author or publisher) if not exempted from copyright protection by the applicable law.

(Article begins on next page)

## **Relationship between two different narrative tasks and reading skills in Finnish**

Mäkinen Leena<sup>1</sup> Loukusa Soile<sup>1</sup> Gabbatore Ilaria<sup>1,2</sup> Kunnari Sari<sup>1</sup>

<sup>1</sup> Research Unit of Logopedics, Child Language Research Center, University of Oulu,  
Finland

<sup>2</sup> Department of Psychology, University of Turin, Italy

Corresponding author:

Leena Mäkinen, University of Oulu, Child Language Research Center, Research Unit of  
Logopedics, P.O. Box 1000, FI-90014, Finland

Email: leena.makinen@oulu.fi

**Abstract**

This three-year follow-up study investigated the associations of narrative and reading skills in typically developing Finnish children. Twenty children performed narrative retelling and story generation tasks twice – at five and eight years of age. Reading comprehension and word recognition tests were performed at the age of eight. Narratives were analysed for relevant information, total number of word tokens, clausal density and evaluation. The results showed increased narrative abilities with age, but the development was not seen in all narrative variables. This suggests that narrative tasks might capture development somewhat differently. Both narrative tasks were connected to reading skills. However, while retelling was connected to reading comprehension only, story generation related to both reading comprehension and word recognition. This study extends prior research by showing that not only retelling but also story generation is associated with reading.

*Keywords:* Finnish, narratives, retelling, reading comprehension, story generation, word recognition

## **I Introduction**

In order to create a coherent, informative and intelligible story, many linguistic and pragmatic skills are needed. Therefore, narratives can be analysed from various viewpoints, but in speech and language studies and for research purposes, narratives have frequently been assessed by story retelling or story generation techniques. In the process of retelling, the child is told a model story and is then asked to tell the story back to the researcher, referring to the previously heard story, typically followed by a series of pictures. Instead, in a story generation design, the child creates the story independently with the help of pictures depicting this story.

Both story retelling and story generation require linguistic (syntactical and semantical) and pragmatic (e.g. use of context) skills and their fluent interplay (e.g. Leinonen, Letts & Smith, 2000; see also Cummings, 2009). Nevertheless, unlike story generation, in retelling, an exact verbal model is given and possibly due to such a model, children produce more complex (i.e. more informative or structurally or syntactically more complex) stories, in story retelling than in generation (Duinmeijer et al., 2012, Kunnari et al., 2016; Merrit & Liles, 1989; Schneider & Dubé, 2005, Schneider, 1996). However, story generation might better reflect genuine storytelling skills, such as narrative organization (Leinonen et al., 2000; Schneider, 1996). Story retelling and story generation seem to require somewhat different underlying abilities, as there is a correlation between narrative retelling and memory skills, whereas no connection is detected with story generation (Duinmeijer et al., 2012; Mäkinen, Loukusa & Kunnari,

2016). Instead, an association between story generation and attention skills is found (Duinmeijer et al., 2012).

### ***1 Association between narrative and reading skills***

There is a strong consensus that phonological processing (e.g., Goswami, 2000; National Early Literacy Panel (NELP), 2008; Parrila, Kirby & McQuarrie, 2004, see also Aro, 2006), along with rapid automatized naming, and letter knowledge (e.g., NELP, 2008; Parrila et al., 2004) are key factors in reading development. However, it is commonly suggested that oral language, including narrative skills, is also the basis for literacy (see discussion in Roth, Speece, Cooper & De La Paz, 1996; Speece, Roth, Cooper & De La Paz, 1999; see also O'Neill, Pearce & Pick, 2004). This is due to the assumption that oral narration and written texts share the same properties, since both are extended and cohesive language units. There are some studies evidencing the importance of oral language, including narration, for reading skills. For example, Kendeou, van den Broek, White and Lynch (2009) found that oral language (i.e. vocabulary and retelling) and early decoding skills are interrelated at the age of four, but this connection becomes weaker during development (see also Storch & Whitehurst, 2002). Oral language also shows unique variance in later reading comprehension, even though this ability is also accounted for by decoding skills, as both of these skills are needed in sufficient reading comprehension (Kendeou et al., 2009). Moreover, Catts et al. (1999) found that the composite measure of semantics, syntax and retelling (oral

language) contributed uniquely to later reading comprehension and to word recognition, independently of phonological awareness or rapid naming.

Some studies have focused particularly on narrative production and its connection to later literacy. As previous research showed narrative retelling is one of the best predictors of the later language ability of children with language disorders (Botting, Faragher, Simkin, Knox & Conti-Ramsden 2001; Stothard, Snowling, Bishop, Chipchase & Kaplan, 1998). However, narrative language is also connected to reading skills among typically developing children. Griffin, Hemphill, Camp and Palmer Wolf (2004) investigated 5-year-old children's play narratives, and found out that the use of textual evaluation and character states were associated with reading comprehension at the age of eight. Wellman et al. (2011) studied a group of children with typical development and language impairment, and showed that school-age reading was associated with earlier narrative retelling. Event content was associated with later reading comprehension and linguistic measures to decoding skills. Reese, Suggate, Long and Schaughency (2010) studied 6-year-old children's retelling and its connection to later reading fluency. The results showed a significant correlation between narrative orientation (composite measure of character introduction and causal and temporal terms), story memory (recalled story propositions) and reading fluency at this age. However, after controlling for early decoding skills, narrative orientation did not predict reading fluency one year later. Interestingly, orientations showed unique variance with reading fluency later – after two and three years of formal reading instruction, even after

controlling for vocabulary and decoding. These results suggest links between narration and reading, depending on the phase of reading development.

In addition to reading, narratives were found to be related to other aspects of academic achievement. Fazio, Naremore and Connell (1996) studied children from low-income families, of whom some were at risk of language impairment. Results show that kindergarten retelling (episodic structure) was the best single predictor of the need for later academic remediation during the first school years. O'Neill et al. (2004) studied 4-year-old children's story-generated narratives and their connection to academic achievement, including reading and mathematical skills, two years later. Results show a significant correlation between narrative variables (vocabulary, event content, mental-state terms, perspective shift, and conjunction use) and mathematics, whereas no connection was evident with reading measures. However, the mathematics test contained lots of tasks requiring semantic and linguistic knowledge.

A clear association between narrative and reading skills was not found by Roth, Speece and Cooper (2002): they studied kindergarten-aged children, who were asked to tell their favourite story, which was analysed for story grammar. This narrative variable did not explain later decoding or reading comprehension either at a first nor a second grade level. Similar results were observed in the study by Snow, Tabors, Nicholson and Kurland (1995), who investigated five-year-old low-income children and showed that the composite measure of story generation task (productivity, evaluation and

complication actions) did not strongly correlate with reading skills in the first grade. Nor was narration (story recall) found to be a predictor of later reading skill in a study by Menyuk and colleagues (1991). They investigated 5-year-old children who were at risk of later reading problems and found that phonological processing was the best predictor of later reading skills at the age of seven, whereas retelling did not show a similar contribution. Gardner-Neblett and Iruka (2015) studied 4-year-olds' retelling in a sample of American children representative of different socioeconomic backgrounds and ethnicities. The results showed that the preschool retelling was only a significant predictor of kindergarten emergent literacy (composite measure of phonological and code-related skills and comprehension skills) for African-American children. According to the authors, this might reflect cultural differences in storytelling styles. For Latino-, Asian- and European-American children, no similar connection was found.

## ***2 Current study***

As previous literature shows, a connection between narrative language and later reading skills seems to be detected when using story retelling design. However, only a few studies have included story generation tasks (see O'Neill et al., 2004; Snow et al., 1995), even though this is a widely used narrative elicitation method in clinical settings and is also utilized in narrative language tests. Thus, it would also be important to investigate the possible linkage between that narrative task and reading. Altogether, it is still challenging to define a clear picture of the predictive value of narration on later reading due to the varying methodology used in previous studies (e.g. differences in



narrative elicitation techniques, narrative variables and in reading measures). In addition, studies of typically developing children are surprisingly scarce, and the age distribution of the participants in these studies has been wide. In addition, all of the previously mentioned studies have been carried out in English, but differences in language typologies and orthographies should be considered. For example, fluent reading is achieved considerably faster in orthographically shallow languages, such as Finnish, while English is a language with a deep orthography and with many inconsistencies, which are demanding for beginning readers (see for a review Aro, 2006). Therefore, we also need studies of narration and reading that are carried out in orthographies different from English, in order to verify the connection between narrative language and reading skills.

The purpose of this study is to investigate longitudinally narrative development in typically developing Finnish children and, particularly, to further explore the associations between narrative and reading skills (word recognition and reading comprehension). We want to investigate whether different narrative tasks (retelling and generation) and several narrative variables (information, total number of word tokens, clausal density, evaluation) show varied connections to reading skills, which is an area still left unexplored. The understanding of typical development is a prerequisite for detecting language and learning impairments, and therefore we focused on typically developing children in this study.

## **II Method**

### ***I Participants and procedure***

Typically developing children participated in this study twice in a period of three years. First, in 2009, 30 five-year-old children participated in a larger study investigating the pragmatic language development in Finnish children. At that time, two narrative tasks, the Bus Story (Renfrew, 1997) and the Edmonton Narrative Norms Instrument, ENNI (Schneider, Dubé & Hayward, 2005) were administered. Three years later, the same children were re-contacted, and 20 eight-year-old children agreed to participate. The same narrative tasks and two reading tests (see descriptions of the tests below) were administered. In the present study, longitudinal data from the 20 children (13 girls, 7 boys) who first participated at the age of five (mean age 5;5) and the second time at the age of eight (mean age 8;5) are reported.

In both of the assessment sessions, parental consent was required. All of the children lived in Oulu (Finland) and attended regular day-care, which they followed up with standard schooling. According to the parental questionnaires completed at the commencement of the study at the age of five, none of the children had a diagnosis of language disorder or exhibited delay in early language acquisition, apart from one child whose parents reported the child not using intelligible speech at the age of three. However, none of the children had received regular speech therapy. Another questionnaire for parents focusing on children's reading skills was delivered at the time of the second assessment, while children were in the second grade. According to the

questionnaires, three children had received special education due to their problems in early reading (e.g. slow reading rate, weak reading motivation), but each of them had acquired reading skills (e.g. able to independently read comics or picture books) by the end of the first year of school.

Children were investigated individually, and assessments were videoed for later analysis. Narratives were transcribed orthographically using the CHAT-format of Child Language Data Exchange System (CHILDES) (MacWhinney, 2000). Story endings, questions asked of the researcher, irrelevant comments and mazes were excluded from the analyses.

## ***2 Assessment methods and data analysis***

***a Narrative language.*** For the retelling, the Bus Story test (Renfrew, 1997) was used. In this task, a child is first told a model story, accompanied by pictures. After listening to the story, the child is encouraged to tell the story back to the researcher with the help of a picture booklet. For the purposes of this study, the model story was translated into Finnish. Following the manual, children's narratives were scored for information units depicting the relevant information of the story. According to the manual, some information units gained two points and others one, resulting in a maximum score of 52. In the original coding, exact references to the characters were needed. If the referent was not specified (e.g. used *it* for the bus), one point was to be deleted. However, in this

study, accurate reference was not required and no points were diminished, so that the scoring would be similar in relation to referential accuracy to the story generation task.

For the story generation, the A3 story of ENNI (Schneider et al., 2005) was used. In this task, the child is first shown a picture booklet. After looking at the pictures, the child is encouraged to tell the story to the researcher. Stories were coded for information, i.e. story grammar (SG) units. Following the manual, the core SG units (initiating event, attempt, and outcome) were scored for two points, and the rest for one point, resulting in a maximum score of 37.

In addition to measures of information, other narrative variables were analysed for both of the tasks. Productivity was measured by calculating the total number of word tokens (TNW). Clausal density (CD) was chosen as a measure of syntactic complexity. CD was calculated by tallying the main and subordinate clauses and dividing the total by the number of utterances. Lastly, emotional and cognitive mental-state terms and character speech were summed up for the narrative evaluation score.

***b Reading skills.*** Reading skills were assessed by two Finnish standardized tests. For reading comprehension, the age-appropriate subtests of Ala-asteen Lukutesti, ALLU (Comprehensive School Reading Test) (Lindeman, 1998) were used. The child's task was independently to read two factual passages and answer 24 multiple choice questions that dealt, for example, with facts, word meanings and inference making.

Each correctly answered question was scored as one point (maximum 24 points). Word recognition was assessed by Sanaketjuesti (Word chain test) (Nevala & Lyytinen, 2000) which is a speeded test, since in Finnish the reading difficulties are especially manifested in poor fluency. The test consists of four subtests that measure orthographical and phonological word recognition, lexical decision and hyphenation. The child was supposed to mark word lines, syllables, pseudowords and spelling errors. Every correctly marked item was scored as one point (maximum score for the whole test 146 points).

### ***3 Reliability and statistical analysis***

20 % of the transcriptions were scored for inter-rater agreement. Reliability was not calculated with TNW since it was automatically calculated by the CLAN program of CHILDES. The intraclass correlation coefficient between the two raters was as follows: Bus Story: information units 0.94; evaluation 0.86; clausal density 0.99 and ENNI: story grammar 0.96; evaluation 0.94; clausal density 0.92.

Since the sample size was small and the data was not altogether normally distributed, nonparametric tests were used. Raw test scores were used for all analyses. For paired comparisons, the significance level was set at 0.006 (Bonferroni adjustment).

## **III Results**

Descriptive statistics for the narrative tests are shown in Table 1 and for reading tests in Table 2. The Wilcoxon signed-rank test shows a development in narrative skills during the three years studied. Children produced more informative stories at the age of eight than five (Bus Story information score:  $Z = 155, p = 0.002$ ; ENNI SG score:  $Z = 155, p < 0.001$ ). Bus Story narratives were also longer at the age of eight than five (TNW:  $Z = 203, p < 0.001$ ), and they included more evaluations ( $Z = 186, p = 0.002$ ). Clausal density was higher in ENNI narratives at the age of eight than at five ( $Z = 201, p < 0.001$ ), but not in Bus Story narratives ( $Z = 139, p = 0.08$ ). The difference in ENNI productivity (TNW:  $Z = 159, p = 0.04$ ) and evaluation ( $Z = 133, p = 0.29$ ) did not reach significance.

“Insert Tables 1 and 2 here”

In order to investigate the associations between narrative and reading skills, the Spearman’s rank correlation coefficients were calculated. First, correlations between narrative variables at age five and reading skills at age eight were performed (Table 3). Results indicate that the Bus Story measures (CD, Evaluation) correlate significantly to later reading comprehension, but no significant correlations were detected with word recognition. Instead, an ENNI SG score correlated with word recognition, and ENNI TNW with reading comprehension. Secondly, similar correlational analyses were carried out in order to find out the concurrent association between narrative and reading skills at the age of eight (Table 3). Results still evidence a connection between the Bus

Story measures (information score, TNW, Evaluation) and reading comprehension, but not with word recognition. Instead, ENNI CD is connected to reading comprehension at the age of eight, whereas an ENNI SG score still shows a significant connection to word recognition.

“Insert Table 3 here”

#### **IV Discussion**

The aim of this study was to explore the connection between narrative abilities and reading skills in Finnish-speaking children. Moreover, the follow-up data allowed for the investigation of narrative development during the three years studied. In line with previous studies (e.g. Mäkinen, Loukusa, Nieminen, Leinonen & Kunnari, 2014; Schneider, Hayward & Dubé, 2006; To, Stokes, Cheung & T-sou, 2010), children produced more informative stories at the age of eight than five. At the age of eight, children also told longer stories and included more evaluations in their retellings, but not in their story generations. Previous research has shown that narrative evaluations increase with age (Shiro, 2003; Ukrainetz et al., 2003). However, genre-specific factors might exist, since, for example, Kunnari et al. (2016) documented that retelling elicits more mental-state language than does generation (see also Shiro, 2003). Instead, clausal density (CD) increased in story generation, but not in retelling. Our results suggest that the retold narratives were syntactically more complex than the generated stories, a finding consistent with previous studies (Duinmeijer et al., 2012; Westerveld & Moran,

2013) at age five, but also three years later. This is likely due to the given model story that children can utilise in retelling from a very young age, since the model story contains complex syntactical structures. The ability to more efficiently utilise the given model story can possibly be seen in the increase in the total number of words and evaluations used in story retelling between the ages of five and eight. In story generation, no model story is given, and in this task the development was seen in the ability to include relevant story elements and in the ability to use complex syntax. These results highlight the fact that different narrative elicitation methods might capture development somewhat differently. Story generation tasks might give a more reliable picture of children's genuine skills of connecting smaller discourse units into a larger whole by means of capturing the developing ability to use complex syntax.

Early retelling (at age five) was connected to later reading comprehension, which is in line with Wellman et al. (2011). Significant correlations were seen in CD and in evaluation. The association was still evident three years later, as Bus Story information score, TNW and, again, evaluation showed significant correlations to reading comprehension. Story generation was also connected to reading skills. Significant correlations were detected between TNW at age five and reading comprehension at age eight and between CD and reading comprehension at age eight. These results contradict previous studies investigating connections between story generation and reading (O'Neill et al., 2004; Snow et al., 1995). This may be due to methodological issues, such as the reading tests used and the differences in participants' ages, since narrative



skills might show various connections to reading according to the phase of a reading achievement (Reese et al., 2010, see also Kendeou et al., 2009; Storch & Whitehurst, 2002).

Interestingly, narrative variables showed somewhat different associations with reading comprehension between assessment times and between the elicitation methods. Surprisingly, when evaluated at the age of five the Bus Story information score was not significantly correlated to later reading comprehension, but showed associations three years later at age eight. It would be logical to assume that the ability to include relevant information in the story would reflect the subject's comprehension skills, and would thus be connected to reading comprehension. However, retelling also requires working memory skills (e.g. Duinmeijer et al., 2012) and perhaps the older children at the age of eight could benefit more from the verbally given model, as they told stories with more relevant information. This finding may reflect not only the children's maturing ability to understand the storyline, but also their ability to utilise memory skills more efficiently.

The linguistic measures were also connected to reading comprehension at the time of both assessments. Bus Story CD was connected to reading comprehension at age five, and ENNI CD at age eight. CD is a measure of syntactic complexity, which may also reflect the ability to create a more coherent and elaborated story, as single clauses are combined into bigger communication units. In the Bus Story, the given model story contains lots of complex sentences, and the ability to include these structures into one's

own narration might reflect comprehension skills that at age five were connected to later reading comprehension. However, the CD evaluated from the ENNI story generation task also showed connections to reading comprehension at age eight. This measure was actually the only story generation measure that was connected to reading comprehension at this age. The reason for this may be the differences between the narrative tasks, as the ability to create complex sentences developed in ENNI narratives and might thus also reflect comprehension. It has been shown that the ability to use complex syntax in narration is crucial to recalling the story (Bishop & Donlan, 2005). Also, TNW showed connections with reading comprehension. TNW, assessed from the Bus Story, was connected to reading comprehension, together with information score at age eight and also from ENNI at age five. Considering both narrative tasks, TNW and information measures were quite strongly correlated and thus probably have common characteristics. TNW also has a semantic component, as it can explain the story content (Mäkinen et al., 2014) and can therefore be connected to reading comprehension.

Finally, the Bus Story evaluation was connected to reading comprehension on both assessment occasions. Also, in previous studies evaluation has proved to be important for predicting reading (Griffin et al., 2004) and mathematical skills (O'Neill et al., 2004). Evaluation includes the ability to use mental-state terms and character speech, which require a knowledge of mental activities and thus comprehension skills (see discussion in, for example, Grazzani & Ornaghi, 2012). However, in retelling, the

advantage of the given model story may again affect the use of evaluation as well as other narrative variables.

Interestingly, ENNI story grammar, both at five and eight years of age, was the only narrative measure that was connected to word recognition. The word recognition test used in this study has a strong semantic component, as it requires the child to distinguish single words from longer word chains and to mark pseudowords. Therefore, this test evidently also measures lexical decision. As Catts et al. (1999) have suggested, a large vocabulary and advanced syntactic skills might foster word recognition skills. The correlation found between word recognition and self-created stories, but not with retold narratives, might imply that, in a story generation, children are using more creative strategy and diverse vocabulary (see Merrit & Liles, 1989). Instead, retelling might be constrained by the model story and thus lead to restricted vocabulary use (Leinonen et al., 2000; Schneider, 1996). However, oral language skills are especially connected to early word recognition skills, as code-related skills are more significant in later word recognition (Storch & Whiterhurst, 2002; see also Kendeou et al., 2009), at least in English. As Finnish and English are remarkably different in orthographies and also in the rate at which fluent reading is achieved (Aro, 2006), there might be some language-specific factors that need to be considered in future studies.

### ***1 Limitations and conclusions***

Limitations concern the small sample size that did not allow for multivariate analyses. This was due to an unfortunate loss of participants during the second assessment phase. Due to the small sample size, these results are only suggestive and need to be replicated in the future. Because narration has a strong linguistic component, it would also be important in future studies to control for the background variables such as vocabulary and comprehension skills. There is some evidence that, even after controlling for the expressive language (Griffin et al., 2004) or receptive vocabulary (Reese et al., 2010), narration is still connected to reading skills. Studies with larger sample sizes and careful investigation of background variables would reveal whether something unique in narratives may relate to reading.

This is the first study to evidence the connection between narrative and reading skills in Finnish. Although there is a common assumption that narrative language is essential in developing reading skills (see critical discussion in O'Neill et al., 2004), surprisingly few studies have documented this connection. The results of this study extend prior research by showing that not only retelling but also story generation is associated with reading skills, at least in the orthographically shallow Finnish language and with typically developing children. Future research should explore such variables in other languages and orthographies as well. Moreover, narratives should be analysed carefully with multiple variables, since they seem to show differentiated linkage to reading. This study implies that narrative and reading skills are connected even before formal reading instruction has started, and this connection is still evident after acquiring reading skills.

Early narrative assessment is important, since difficulties in narration may imply later learning and reading difficulties. However, much work is still needed to understand the role of narrative abilities in reading.

### **Acknowledgements**

The permission for translating the Bus Story into Finnish was received from the publisher. Permission to use ENNI was received from Professor Schneider. The authors thank Annamaria Mäntylä, MA for her help in the data collection and Anna-Kaisa Tolonen, MA for her contribution in reliability analyses. Special thanks to all the children and their families who participated in the study.

### **Declaration of Conflicting Interest**

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### **Funding**

This work was supported by the Finnish Brain Foundation; the Finnish Cultural Foundation; the Oulu University Scholarship Foundation; the University of Oulu Faculty of Humanities, and the Academy of Finland.

## References

Aro, M. (2006). Learning to read: the effect of orthography. In M.R. Joshi & P.G. Aaron (eds.). *Handbook of orthography and literacy*. (pp. 531–550). Mahwah, NJ: Lawrence Erlbaum Associates.

Bishop, D.V.M. & Donlan, C. (2005). The role of syntax in encoding and recall of pictorial narratives. Evidence from specific language impairment. *British Journal of Developmental Psychology*, 23, 25–46.

Botting, N., Faragher, B., Simkin, Z., Knox, E., Conti-Ramsden, G. (2001). Predicting pathways of specific language impairment: What differentiates good and poor outcome? *Journal of Child Psychology and Psychiatry*, 42, 1013–1020.

Catts, H.W., Fey, M.E., Zhang, X. & Tomblin, B. (1999). Language basis of reading and reading disabilities: evidence from a longitudinal investigation. *Scientific Studies of Reading*, 3, 331–361.

Cummings, L. (2009). *Clinical pragmatics*. Cambridge, UK: Cambridge University Press.

Duinmeijer, I., de Jong, J. & Scheper, A. (2012). Narrative abilities, memory and attention in children with a specific language impairment. *International Journal of Communication and Language Disorders*, 47, 542–555.

Fazio, B.B., Naremore, R.C. & Connell, P.J. (1996). Tracking children from poverty at risk for specific language impairment: A 3-year longitudinal study. *Journal of Speech and Hearing Research*, 39, 611–624.

Gardner-Neblett, N. & Iruka, I.U. (2015). Oral Narrative Skills: Explaining the Language-Emergent Literacy Link by Race/Ethnicity and SES. *Developmental Psychology*, 51, 889–904.

Grazzani, I. & Ornaghi, V. (2012). How do use and comprehension of mental-state language relate to theory of mind in middle childhood? *Cognitive Development*, 27, 99–111.

Goswami, U. (2000). Phonological and lexical processes. In L. Kamil, P.B. Mosenthal, P.D. Pearson & R. Barr (eds.). *Handbook of reading research*. Volume III. (pp. 251–268). Mahwah, NJ: Lawrence Erlbaum.

Griffin, T.M., Hemphill, L, Camp, L. & Palmer Wolf, D. (2004). Oral discourse in the preschool years and later literacy skills. *First Language*, 24, 123–147.

Kendeou, P., van den Broek, P., White, M.J. & Lynch, J.S. (2009). Predicting reading comprehension in early elementary school: the independent contributions of oral language and decoding skills. *Journal of Educational Psychology*, 101, 765–778.

Kunnari, S., Välimaa, T. & Laukkanen-Nevala, P. (2016). Macrostructure in the narratives of monolingual Finnish and bilingual Finnish-Swedish children. *Applied psycholinguistics*, 37, 123–144.

Leinonen, E., Letts, C. & Rae Smith, B. (2000). *Children's pragmatic communication disorders*. London, UK: Whurr Publishers.

Lindeman, J. (1998). *Ala-asteen lukutesti. [The Comprehensive School Reading Test]*. Finland: University of Turku.

MacWhinney, B. (2000). *The CHILDES project: Tools for analyzing talk*. Mahwah, NJ: Erlbaum.

Menyuk, P., Chesnick, M., Weis Liebergott, J., Korngold, B., D'Agostino R. & Belanger, A. (1991). Predicting reading problems in at-risk children. *Journal of Speech and Hearing Research*, 34, 893–903.



Merrit, D.D. & Liles, B.Z. (1989). Narrative analysis: clinical applications of story generations and story retellings. *Journal of Speech and Hearing Disorders*, 54, 429–438.

Mäkinen, L., Loukusa, S., Nieminen, L., Leinonen, E. & Kunnari, S. (2014). The development of narrative productivity, syntactic complexity, referential cohesion, and event content in four- to eight-year-old Finnish children. *First Language*, 34, 24–42.

Mäkinen, L., Loukusa, S. & Kunnari, S. (2016). Kuvasarjakerronnan ja kielellisen työmuistin välinen yhteys tyypillisesti kehittyneillä lapsilla ja lapsilla, joilla on kielellinen erityisvaikeus. [Picture-based narratives and verbal working memory in children with typical language development and specific language impairment.] *Puhe ja Kieli*, 36, 33–44.

National Institute for Literacy, NELP (2008). *Developing early literacy. Report of the National Early Literacy Panel*. Maryland: National Institute for Literacy.

Nevala, J. & Lyytinen, H. (2001). *Sanaketjutesti [Word Chain Test]*. Jyväskylä: Niilo Mäki Instituutti ja Jyväskylän yliopiston Lapsitutkimuskeskus.

O'Neill, D.K., Pearce, J.M. & Pick, J.L. (2004). Preschool children' narratives and performance on the Peabody Individualized Achievement Test – Revised: evidence of a

relation between early narrative and later mathematical ability. *First Language*, 24, 149–183.

Parrila, R., Kirby, J.R. & McQuarrie, L.M. (2004). Articulation rate, naming speed, verbal short-term memory, and phonological awareness: Longitudinal predictors of early reading development? *Scientific Studies of Reading*, 8, 3–26.

Reese, E., Suggate, S., Long, J. & Schaughency, E. (2010). Children's oral narrative and reading skills in the first 3 years of reading instruction. *Reading & Writing*, 23, 627–644.

Renfrew, C. (1997). *Bus Story Test: a test of narrative speech*. Milton Keynes, UK: Speechmark.

Roth, F.P., Speece, D.L., Cooper, D.H. & De La Paz, S. (1996). Unresolved mysteries: how do metalinguistic and narrative skills connect with early reading? *The Journal of Special Education*, 30, 257–277.

Roth, F.P., Speece, D.L., Cooper, D.H. (2002). A longitudinal analysis of the connection between oral language and early reading. *The Journal of Educational Research*, 95, 259–272.

Schneider, P. (1996). Effects of pictures versus orally presented stories on story retellings by children with language impairments. *American Journal of Speech-Language Pathology*, 5, 86–96.

Schneider, P. & Dubé, R.V (2005). Story presentation effects on children's retell content. *American Journal of Speech-Language Pathology*, 14, 52–60.

Schneider, P., Dubé, R.V. & Hayward, D. (2005.) *The Edmonton Narrative Norms Instrument*. Retrieved from University of Alberta Faculty of rehabilitation medicine website: <http://www.rehabmed.ualberta.ca/spa/enni>.

Schneider, P., Hayward, D. & Dubé, R.V. (2006). Storytelling from pictures using the Edmonton Narrative Norms Instrument. *Journal of Speech-Language Pathology and Audiology*, 30, 224–238.

Shiro, M. (2003). Genre evaluation in narrative development. *Journal of Child Language*, 30, 165–195.

Snow, C.E., Tabors, P.O, Nicholson, P.A. & Kurland, B.F. (1995). SHELL: Oral language and early literacy skills in kindergarten and first-grade children. *Journal of Research in Childhood Education*, 10, 37–48.

Speece, D.L., Roth, F.P. Cooper, D.H. & De La Paz, S. (1999). The relevance of oral language skills to early literacy: a multivariate analysis. *Applied Psycholinguistics*, 20, 167–190.

Storch, S.A. & Whitehurst, G.J. (2002). Oral language and code-related precursors to reading: evidence from a longitudinal structural model. *Developmental Psychology*, 38, 934–947.

Stothard, S.E., Snowling, M.J., Bishop, D.V.M., Chipchase, B.B. & Kaplan, C.A. (1998). Language-impaired preschoolers: A follow-up into adolescence. *Journal of Speech, Language, and Hearing Research*, 41, 407–419.

To Kit-Sum, C., Stokes, S.F., Cheung Hin-Tat & T'sou, B. (2010). Narrative assessment of Cantonese-speaking children. *Journal of Speech, Language, and Hearing Research*, 53, 648–669.

Wellman, R.L., Lewis, B., Freebairn, L.A., Avrich, A.A., Hansen, A.J., Stein, C.M. (2011). Narrative ability of children with speech sound disorders and the predictions of later literacy skills, *Language, Speech and Hearing Services in Schools*, 42, 561–579.

Westerveld, M.F. & Moran, C.A. (2013). Spoken expository discourse of children and adolescents: retelling versus generation. *Clinical Linguistics & Phonetics*, 27, 720–734.



Table 1. Narrative measures.

	Story content	TNW	CD	Evaluation
Bus Story at age 5				
<i>M</i> (SD)	25.15 (10.98)	87.00 (31.75)	1.41 (.35)	5.70 (3.16)
<i>Med</i> (range)	22.50 (5–43)	96.00 (12–137)	1.39 (.86–2.11)	6.00 (0–11)
Bus Story at age 8				
<i>M</i> (SD)	33.10 (5.39)	122.80 (32.98)	1.60 (.28)	8.80 (2.35)
<i>Med</i> (range)	33.50 (22–42)	120.00 (68–188)	1.53 (1.05–2.11)	9.00 (4–12)
ENNI at age 5				
<i>M</i> (SD)	20.15 (6.11)	91.40 (34.94)	1.19 (0.14)	6.7 (4.32)
<i>Med</i> (range)	21.00 (10–28)	79.00 (36–163)	1.18 (1.00–1.61)	6.5 (2–21)
ENNI at age 8				
<i>M</i> (SD)	27.15 (1.83)	118.65 (36.44)	1.35 (0.15)	7.40 (2.60)
<i>Med</i> (range)	27.00 (24–30)	111.50 (75–214)	1.35 (1.14–1.67)	6.5 (4–12)

TNW = total number of word tokens, CD = clausal density

Table 2. Reading test scores at age 8.

Test	Mean	SD	Range
Word recognition			
raw scores	51.85	21.51	16–90
skill level	5.10	1.74	1–8
Reading comprehension			
raw scores	17.15	3.25	11–23
skill level	5.35	1.53	3–8

Word recognition test: skill level 1 very weak, 2 weak, 3 below average, 4 low average, 5 average, 6 above average, 7 good, 8 very good.

Reading comprehension test: skill levels 1-3 below average, 4-6 average, 7–9 above average.