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**PIRET SOODLA**

Picture-Elicited Narratives of Estonian  
Children at the Kindergarten-School  
Transition as a Measure  
of Language Competence



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## LIST OF THE ORIGINAL PUBLICATIONS

- I Soodla, P., & Kikas, E. (2010). Macrostructure in the narratives of Estonian children with typical development and language impairment. *Journal of Speech, Language, and Hearing Research*, 53, 1321–1333.
- II Soodla, P., & Kikas, E. (2011). Oral narratives of 6–7 years old Estonian children. In M. Veisson, E. Hujala, M. Waniganayake, P. Smith, & E. Kikas (Eds.) *Global Perspectives in Early Childhood Education: Diversity, Challenges and Possibilities* (pp. 217–235). Frankfurt: Peter Lang.
- III Soodla, P., Kikas, E., Pajusalu, R., Adamka, A., & Parm, S. (2010). Vahendamata ja vahendatud narratiiv laste kõnearengu hindamisel. *Eesti Rakenduslingvistika Ühingu aastaraamat*, 6, 277–296.
- IV Soodla, P., & Kikas, E. Narrative production under three different task conditions: Relations with other pre-reading skills and contribution to reading comprehension. Manuscript submitted for publication.

Contribution of the author was as follows:

- In Studies I–III, the author worked out the instrument of narrative production skills, designed the study, participated in data collection, carried out statistical analysis, and wrote the manuscripts.
- In Study IV, the author worked out the instrument of narrative production skills, designed the study, participated in data collection, participated in carrying out statistical analysis, and wrote the manuscript.

## ABBREVIATIONS

AK	–	Alakōne
ALC	–	Average level of language competence
C-unit	–	Communication unit
EK	–	Eakohane kōne
GE	–	Grammatical errors
HLC	–	High level of language competence
INC	–	Index of narrative complexity
LI	–	Language impairment
LLC	–	Low level of language competence
MLCU	–	Mean length of communication units
NG	–	Narrative generation
NR	–	Narrative retelling
PA	–	Phonological awareness
RC	–	Reading comprehension
SG	–	Story grammar
SLI	–	Specific language impairment
TD	–	Typical language development
TNW	–	Total number of words in narrative
VK	–	Vocabulary knowledge

## PREFACE

This doctoral dissertation is about one discourse genre – narrative. The term *narrative* is widely used in several disciplines, but its meanings and implications vary according to its provenance. In the context of applied sciences such as education, psychology, and speech-language pathology, narratives are referred to as stories about real or imagined events that are constructed by weaving together sentences about situational contexts, characters, actions, motivations, emotions, and outcomes (Gillam & Pearson, 2004). In the present work, children’s narratives are examined. Hereinafter, the terms *narrative*, *narrative text*, and *story* as well as *narrative production* and *storytelling* are used as synonyms.

Children’s narratives have been a focus of research on language development in the past couple decades. Numerous studies have been carried out to determine the role of produced narratives in language assessment for identification of children with language impairment (e.g., Botting, 2002; John, Lui, & Tannock, 2003; Liles, Duffy, Merritt, & Purcell 1995; Merritt & Liles, 1987; Ukrainetz, Justice, Kaderavek, Eisenberg, Gillam, & Harm, 2005; Scott & Windsor, 2000) as well as those who have risk for reading comprehension difficulties (e.g., Cain, 2003; Cain & Oakhill, 1996; Chang, 2006; Feagans & Appelbaum, 1986; Griffin, Hemphill, Camp, & Wolf, 2004). However, there are relatively many dissimilarities in the findings of the previously-mentioned research which may be partially due to different story eliciting methods. Discrepancies between findings may also be due to differences in socio-cultural contexts and languages that play significant roles in narrative production (Berman & Slobin, 1994; Fiestas & Peña, 2004; Gutiérrez-Clellen, 2002; McCabe, 1997; Rollins, McCabe, & Bliss, 2000; Westby, Moore, & Roman, 2002). For that reason, caution should be exercised when generalizing about the results of reported studies carried out with different methods as well as in different languages and culture groups.

In Estonia, need for instruction of storytelling skills is highlighted in the didactic literature (e.g., Hallap & Padrik, 2008; Karlep, 2003; Padrik & Hallap, 2008, Uibu & Voltein, 2010) as well as in national curricula for preschool and basic school education (Vabariigi Valitsus, 2008, 2010). However, there is still a lack of reliable knowledge about these skills of children at the beginning of school. Considering the importance of narrative skills in children’s daily life and in the school context as well as influence of those skills on their further academic achievement, more comprehensive insight to stories produced by Estonian school beginners is needed. In addition, although narrative assessment is widely suggested as part of language assessment, Gillam and Pearson (2004) argue that speech-language therapists and special education teachers traditionally use subjective and time-consuming language sampling methods to assess children’s narrative skills. This holds also true in Estonia where no reliable instruments are available for the assessment of storytelling skills. Thus,



a more comprehensive knowledge about the advantages of different story eliciting methods in narrative assessment procedures is necessary. The present research intends to fill some of these gaps.

The general aim of this doctoral dissertation was to develop and test an assessment tool of narrative production skills of Estonian school beginners which might be used by speech-language therapists and special education teachers for screening children with language impairment (LI) and at risk for reading difficulties. The dissertation comprises four original publications and an introduction which provides a theoretical basis for the study and outlines the structure of narrative text, the development of storytelling skills of children with typical language development (TD) and with LI, and the use of children's narratives in language assessment for identifying children with LI and those who are at risk for reading comprehension difficulties.

# I. THEORETICAL BACKGROUND

The theoretical basis of the present dissertation relies on a viewpoint presented by van Dijk (1997) that supposes that discourse analysis needs an integration of three main approaches: (1) focus on discourse itself, that is on *structures* of text or talk; (2) study of discourse and communication as *cognition*; and (3) focus on *social structure and culture*. In the context of the present dissertation, discourse analysis entails explaining a child's narrative structure, taking the storytelling process as well as the context into account – both in terms of task conditions and broader socio-cultural background.

## I.1. Narrative Structure Levels

Texts are organized at two structural levels – micro- and macrostructure. The microstructure is the local structure of the text, the sentence-by-sentence information. The macrostructure is a hierarchically ordered set of propositions representing the global structure of the text that is derived from the microstructure (Kintsch, 1998; van Dijk & Kintsch, 1983). Although there are no „gold standard“ guidelines that identify the most salient outcome variables to be studied during narrative assessment, current best practice suggestions emphasize the importance of analyzing narrative performance at these two structural levels (see Gillam & Pearson, 2004; Haynez & Pindzola, 2008; Hughes, McGillivray, & Schmidek, 1997).

**Narrative macrostructure.** There are several approaches to narrative macrostructure analysis. One of the most widely used characterization of narrative macrostructure is the story grammar (SG) analysis that was developed by Stein and Glenn (1979). SG components are the categories of information that are typically provided in a certain order within episodes of folktales and fables. According to this model, a fictional story consists of a setting category plus an episode system. The setting statement includes an introduction of the main character(s) and describes the story's social, physical, or temporal context. An episode includes six sequential components beginning with an initiating event which influences a character, followed by the character's internal response to this event; the character's internal plan to solve the problem or change the situation; the character's attempt to solve the problem; a consequence which is caused by the attempt; and, finally the character's reaction to the consequence. Adults' and children's narratives do not always include episodes which consist of all of these components, for different reasons: some components may be omitted because of the narrator's lack of story-telling skills or must be inferred through statements that are embedded in the story or through the listener's world knowledge (Hughes et al., 1997). A simple story contains one episode, but most stories are more complex, including two or more episodes which can be related to each other in several ways.

Researchers have determined that some SG categories are structurally more important than others. Definitions of a good, coherent story are related to explicit reference to the goal-directed action of a protagonist. Thus, a goal-based episode is defined as having some reference to three components: (1) an initiating event/a problem/an internal response/a goal, (2) the attempts to achieve the goal, and (3) a direct consequence (Berman & Slobin, 1994; Liles et al., 1995; Stein & Albro, 1997). The episode is considered to be incomplete if one or more of these essential elements are missing.

Another common approach to narrative macrostructure analysis is high point analysis, initially created by Labov and Waletzky (1967/1997) and later developed by McCabe and colleagues (see Peterson & McCabe, 1997) and Hudson and Shapiro (1991). High point analysis has been developed to describe the fundamental structure of personal narratives (i.e., stories that relate events experienced by the narrator). According to this approach, narrative consists of the following parts: opening appendage, orientation, complicating action, evaluation, resolution, and closing appendage. The evaluation is critical for high point analysis, giving significance to the narrative by providing information about why the narrative was told, what the main goal of the narrative was, and how the person, place, or event should be assessed by the receiver. The evaluation may be expressed through particular words, phonology, or attaching an evaluative dependent clause. In recent studies (see Hughes et al., 1997; Ukrainetz et al., 2005; Ukrainetz & Gillam, 2009), various types of evaluation (called also *expressive elaboration*) have been described, such as repetition, stress, metaphors, attention-getters, negatives, intentions, desires, causal explanations, objective and subjective judgments, dialogue, etc. In sum, high point analysis focuses upon what the narrative meant to the storyteller and relies more upon emotional information than upon psychological or physical causality, which is a strength of SG approach.

**Narrative microstructure.** Microstructure includes the smaller units within the narrative, consisting of the underlying network of ideas put into sequences of sentences. Microstructural analysis may comprise word-level indices such as lexical diversity, measured as lexical richness, and/or use of literacy language style (Fey, Catts, Proctor-Williams, Tomblin, & Zhang, 2004; Scott & Windsor, 2000). Grammaticality (e.g., mean length of utterances, number or proportion of complex utterances, types of conjunctions, grammatical accuracy) is also often the focus of narrative microstructure analysis (Justice, Bowles, Kaderavek, Ukrainetz, Eisenberg, & Gillam, 2006; Liles et al., 1995; Norbury & Bishop, 2003; Schneider, Dubé, & Hayward, 2005; Scott & Windsor, 2000; Tilstra & McMaster, 2007), reflecting mastery of storytelling at the sentence level. In addition, the storyteller must tie together a series of related sentences, using cohesive ties. Cohesive ties are the ways that sentences „stick together“ or cohere into a unit to form a whole (Hughes et al., 1997). The traditional categorization of these linguistic devices that function to make connections among sentences (*cohesive markers*) comes from Halliday and Hasan (1976):

reference, conjunction, lexical cohesion, substitution, and ellipsis. Due to the rich source materials provided in stories (Peterson & McCabe, 1991), cohesion analysis is widely used in narrative assessment procedures (e.g., Liles, 1987; Liles et al., 1995; Peterson & McCabe, 1991; Shapiro & Hudson, 1991; Schneider et al., 2005). In addition, microstructural analysis may comprise indices of productivity, measured as total number of words, clauses or sentences (Merritt & Liles, 1987; Norbury & Bishop, 2003; Pearce, McCormack, & James, 2003; Schneider et al., 2005; Scott & Windsor, 2000; Stein & Albro, 1997; Tilstra & McMaster, 2007; Ukrainetz et al., 2005; Wagner, Sahlén, & Nettelbladt, 1999).

**Relations between narrative structure levels.** Relatively few studies are available for analysis of the relationship between macrostructure and microstructure measures. Liles et al. (1995) have shown by factor analysis that macro- and microstructural variables represent two distinct underlying areas of narrative competence. However, some aspects of narrative microstructure have been found to be related to macrostructure. Namely, Liles et al. found that the index of cohesion, used as a measure of microstructure level, was moderately related to the macrostructure of narratives. This result substantiates the previous findings of Peterson and McCabe (1991) which suggest that some aspects of cohesion (i.e., intersentential conjunctives such as *then*, *because*, *so*, *but*, and etc) facilitate and/or interact with a higher order organizational principle besides local semantic coherence, serving pragmatic functions and marking narrative macrostructure. In addition, significant moderate relations between self-generated narrative macrostructure, measured according to the SG model, and story length have been found (Stein & Albro, 1997; Wagner et al., 1999). However, moderate correlations between narrative macrostructure and length suggest that although a long story usually refers to its high level of global organization of the story and *vice versa*, sometimes a verbose narrative may also include much irrelevant and extraneous information (Merritt & Liles, 1987; Wagner et al., 1999).

## **I.2. Development of Narrative Production Skills**

In the process of narrative production, a number of higher level skills are involved, including abilities to sequence events, to create a cohesive text through the use of explicit linguistic markers, to use precise vocabulary, to convey ideas without extralinguistic support, to understand cause-effect relationships, and to structure the narration along the lines of universal story schemata that aid the listener in comprehending the tale (Paul & Smith, 1993). When children grow, developmental changes of these language and cognitive skills take place. However, if a child's language and/or cognitive development is impaired, the child will exhibit difficulties with storytelling skills as well.

### **Development of narrative production skills in typical development.**

Narratives reflect the social values, beliefs, dilemmas, and goals that underlie and motivate human interaction. Thus, telling a story requires not only an understanding of human intentionality and goal-directed action but also knowledge of the concept of a good story (Stein & Albro, 1997). Research has found that at least by the age of two and a half years, children have acquired a rich knowledge of human intentionality and goal-directed action (see Stein & Albro, 1997). However, by the age of three years, they produce descriptive sequences with no temporal order and action sequences without causal order. By the age of five they are able to tell stories organized in terms of goals and plans (see Nelson, 1996). However, at the age of six or seven, children can exhibit narrative skills needed to encompass all obligatory SG components represented in *complete episodes* (see Hughes et al., 1997). During maturation, frequency and use of all SG components in narratives increases (Muñoz, Gillam, Peña, & Gulley-Faehnle, 2003; Schneider et al., 2005; Stein & Glenn, 1979). SG components such as settings, initiating events, actions, and consequences are most frequently included in narratives of kindergarten and elementary school age children (John et al., 2003; Merritt & Liles, 1987; Stein & Glenn, 1979) because these categories represent concrete events which may be easier for children to understand. The character's internal responses and reactions are the least likely to be produced in children's stories, but the frequency of these components increases significantly as they grow older (John et al., 2003; Stein & Glenn, 1979). A *complex episode* level that includes the elaboration of a complete episode by including multiple plans, attempts, or consequences within an episode as well as an obstacle to the attainment of a goal is attainable by around eleven years. Further development of narrative macrostructure results in stories which have one episode embedded within another (*embedded episode*) or narratives which include two perspectives (*interactive episode*). The latter story structure levels are attainable by the age of 11–12 years (see Hughes et al., 1997). The development of evaluation in terms of frequency and diversity of evaluative elements increases also during the childhood and adolescence (Bamberg & Damrad-Frye, 1991; Ukrainetz et al., 2005; Ukrainetz & Gillam, 2009).

Children's storytelling skills at the narrative microstructure level also improve considerably during development. Clear developmental patterns have been shown in narrative length (Reilly, Losh, Bellugi, & Wulfbeck, 2004; Tilstra & McMaster, 2007; Ukrainetz et al., 2005), meaning that as children grow older, they are able to produce longer stories. With regard to lexical diversity, results also show increases during the maturation (Justice et al., 2006; Miller, 1991). In addition, grammaticality in terms of mean length, complexity or accuracy of utterances (Justice et al., 2006; Tilstra & McMaster, 2007), and cohesion in terms of frequency and diversity of accurately used cohesive markers have been found to improve during development (Peterson & Dodsworth, 1991, Shapiro & Hudson, 1991).

**Narrative production skills of children with language impairment.** Children with language disorders typically have difficulties with speech perception, working memory, phonological representation, vocabulary, morphology, syntax, or pragmatics (Leonard, 1998). Impairments in these aspects of language and cognition interfere with the ability to process and use narrative discourse as well. Numerous studies on narrative production have been carried out with children with specific language impairment (SLI) whose LI occurs as the primary factor without obvious accompanying conditions such as mental retardation, neurological damage, or hearing impairment (e.g., Bishop & Donlan, 2005; Botting, 2002; Dodwell & Bavin, 2008; Fey et al., 2004; Greenhalgh & Strong, 2001; Merritt & Liles, 1987; Miranda, McCabe, & Bliss, 1998; Liles et al., 1995; Norbury & Bishop, 2003; Pearce et al., 2003; Schneider, Hayward, & Dubé, 2006). In addition, storytelling skills of those children who have LI concomitant with low non-verbal ability have been extensively studied in previous research (e.g., Fey et al., 2004; Pearce et al., 2003; Wetherell, Botting, & Conti-Ramsden, 2007).

With regard to narrative macrostructure, research has shown that children with LI have weaker skills when compared to their peers with TD. A number of studies have shown that the inclusion of SG elements in retold and self-generated narratives of LI children differs from that of children whose language development is considered as being typical (Copmann & Griffith, 1994; Merritt & Liles, 1987; Ripich & Griffith, 1988). In addition, the quantity of obligatory elements (i.e., information that is needed for adequate understanding of a story by a listener; called also *central* or *basic information*) included in narratives of LI children has been found to be considerably smaller than in those of their TD peers (Hayward, Gillam, & Lien, 2007; Miranda et al., 1998; Reilly et al., 2004; Schneider et al., 2006; Wagner et al., 1999). The omission of central information reflects a limited awareness of the communicative needs of the listener or disability to meet those needs (Miranda et al., 1998). Research has also shown that children with LI may have difficulties with event sequencing (Hayward et al., 2007; Miranda et al., 1998) and with inserting evaluative comments (Reilly et al., 2004; Ukrainetz & Gillam, 2009) in their stories.

However, some studies have shown that not all of LI children necessarily have difficulties with storytelling skills at the narrative macrostructure level (Bishop & Donlan, 2005; Boudreau, 2008; Hayward & Schneider, 2000; Pearce et al., 2003; Schneider et al., 2006; Tsai & Chang, 2008). Moreover, research has shown that narrative performance at the macrostructure level is significantly related to cognitive development, with more critical disability in cases when a child's nonverbal intelligence, in addition to language development, is impaired (Norbury & Bishop, 2003; Reilly et al., 2004; Wetherell et al., 2007).

Research on narrative microstructure has also brought forth the difficulties of children with LI in storytelling tasks. For example, stories of children with LI, as compared to those with TD, tend to be shorter (Fey et al., 2004; Pearce et al., 2003; Peña, Gillam, Malek, Ruiz-Felter, Resendiz, Fiestas & Sabel, 2006;

Reilly et al., 2004; Scott & Windsor, 2000; Tsai & Chang, 2008; Wagner et al., 1999), contain simpler syntax and more grammatical errors (Fey et al., 2004; Gillam & Johnston, 1992; Hewitt, Hammer, Yont, & Tomblin, 2005; Liles et al., 1995; Reilly et al., 2004; Scott & Windsor, 2000; Tsai & Chang, 2008), and exhibit less diverse and sophisticated vocabulary (Fey et al., 2004; Hewitt et al., 2005; Tsai & Chang, 2008). In addition, the use of cohesive markers has been indicated to be significantly weaker in narratives of children with LI (Liles et al., 1995; Ripich & Griffith, 1988; Tsai & Chang, 2008). Like for narrative macrostructure, a broad heterogeneity in microstructure measures has been found among children with LI as well (Scott & Windsor, 2000; Tsai & Chang, 2008). In contrast, some microstructure measures have been indicated as more reliable than macrostructure measures in differentiating children with LI, especially those with SLI, from children with TD (Liles et al., 1995; Scott & Windsor, 2000).

### **I.3. Contextual Factors that Influence Narrative Production**

**Socio-cultural and linguistic context.** Children's narrative development is considered to be broadly situated in the social contexts, cultural institutions, and practices in which narratives are created and shared with one another. More specifically, children's narratives and their storytelling skills are seen to be structured, constrained, and supported through features of the activity, its purpose, and the social and cultural contexts in which the narration occurs (Mistry, 1993). First, parent input in terms of the types of parent-child conversations (Nelson & Fivush, 2006; Peterson, Jesso, & McCabe, 1999) and literacy-related activities such as shared story reading (Lever & Sénéchal, 2011; Zevenbergen, Whitehurst, & Zevenbergen, 2003) have been found to be related to children's narrative production skills. Storytelling traditions may also be distinct according to culture: while in European-based cultures, children are generally encouraged to listen to and tell different types of stories (Westby et al., 2002), in some non-European cultures, children are rarely the center of attention for storytelling and have neither been taught nor encouraged to express themselves (Stein, 2004; Westby et al., 2002). Moreover, narratives *themselves* have been found to be distinctly organized in diverse cultural groups: while in European-based cultures, traditional stories include explicit reference to the goal-directed action of a protagonist and reflect the structure represented by Stein and Glenn (1979), in some other culture, individuals tend to structure their stories differently in terms of characters' goals and plans (Westby et al., 2002), event sequencing (McCabe, 1997; Rollins et al., 2000), or audience involvement (see Gutiérrez-Clellen & Quinn, 1993).

Estonia belongs to the European culture by virtue of its values, traditions, and forms of storytelling. European children's literature has had a substantial influence on Estonian children's books (Krusten, 1995), and numerous foreign children's books have been translated

into Estonian. In addition, skills of narrative comprehension and production have been aims stated in previous and present national curricula for preschool (Vabariigi Valitsus, 1999/2006, 2008) and basic school education (Vabariigi Valitsus, 2002/2007, 2010). Thus, based on similarities of cultural background in terms of storytelling values, traditions and forms, the structural patterns of narratives produced by Estonian children should be comparable to those of their peers in other European-based cultures.

Narrative differences may also be due in part to linguistic factors. Several studies have been carried out with children with different native languages (e.g., see Berman & Slobin, 1994) and bilingual children (e.g., see Verhoeven & Strömqvist, 2001) and have found that the influence of a particular language is present when choosing linguistic devices that play a role in narrative (e.g., those used for the expression of temporal and causal relations, event structure, and cohesion). However, the findings also suggest that in producing coherent and cohesive narrative, general cognitive and expressive development is responsible, over and above the demand and constraints of acquiring a particular language (Berman & Slobin, 1994; Chang, 2006).

**Story elicitation context.** There are several factors in story elicitation context (called also *task condition*) that may affect the outcome of narrative production, including story eliciting methods in terms of story generation or retelling, story modeling (narration with previous model story or without that), prompt conditions (visual and/or verbal prompts), and listener circumstances (shared or not shared context). Two of these aspects of story elicitation context – story eliciting methods in terms of generation and retelling and story modeling are the focus of the present research and are discussed below.

Fictional stories can be elicited by generation or retelling methods. Retelling tasks explore a child's ability to relate a previously presented story, whereas narrative generation requires more independent storytelling abilities (Schneider, Hayward, & Dubé, 2006). Because story generation tasks are more representative of spontaneous communication and independent storytelling abilities (Liles, 1993; Schneider et al., 2006), this method is suggested for the language assessment for children whose language is more mature or for whom a more rigorous assessment of narrative ability is needed (Hughes et al., 1997). Nevertheless, studies of children's retelling skills, as compared to studies of story generation, are more represented in the research literature. The reason is probably related to the advantages of a retelling procedure over a generation procedure, including better control over narrative length, narrative complexity, error analyses, and reliability (see Liles, 1993). Comparing self-generated and retold narratives of elementary school children with and without LI, research has found that both groups of children used SG organization across tasks, but



retold stories were generally longer and more complete in terms of macrostructure (Merritt & Liles, 1989; Ripich & Griffith, 1988). A similar pattern of results was obtained in studies of Schneider and Dubé in which kindergarten and elementary school children provided more story information (Schneider, 1996; Schneider & Dubé, 2005) and more adequate referential cohesion (Schneider & Dubé, 1997) when retelling stories than when formulating stories from pictures alone.

In story generation tasks, the eliciting procedure can vary with the story modeling that precedes narration. Story modeling in terms of a training story (i.e., joint storytelling by the child and the adult) or a model story (i.e., a „good“ story told by the adult) that precedes independent narration is provided with the purpose to familiarize the child with the procedure, to allow the examiner to give more explicit prompts if the child has difficulty with the task, and to provide opportunities for inspiration and imitation (Hughes et al., 1997; Schneider et al., 2006; Ukrainetz & Gillam, 2009). Although story modeling is suggested in clinical assessment (see Hughes et al., 1997), there is lack of clear evidence about effect of a model story on children’s narrative production. An exception is the research of Ukrainetz and Gillam (2009) in which elements of expressive elaboration in previously modeled narratives of six and eight year old children with TD and LI were compared. The results indicated that relatively few children imitated the adult model, but those children who did imitate the models in their stories were usually older participants, particularly those with typical development.

#### **I.4. Narrative as a Tool Identifying Children with Language Impairment**

The SG model has been widely used in the assessment of narrative production skills at the macrostructure level for clinical purposes. Several coding methods exist to analyze the SG organization of children’s narratives such as examining them for inclusion (presence or frequency) of SG components (e.g., Merritt & Liles, 1987; John et al., 2003) or for story structure level in terms of complete and incomplete episodes (e.g., Merritt & Liles, 1987; Ripich & Griffith, 1988). However, results of the previous studies that have used these coding methods are contradictory, and more recent research (Liles et al., 1995; Norbury & Bishop, 2003) show that narrative assessment in terms of story structure levels does not lead to clear differentiation of children’s language abilities.

An alternative approach to analyzing a narrative’s macrostructure in terms of SG organization is to examine it for the quantity of central and obligatory information included in stories. Different methods exist in the scoring the amount of story information in narratives (e.g., Hayward & Schneider, 2000; Norbury & Bishop, 2003; Paris & Paris, 2003; Price, Roberts & Jackson, 2006; Schneider et al., 2005, 2006; Wagner et al., 1999) but only a few studies are

available using scoring methods which compare stories of children with TD to those of children with LI. Moreover, the findings are contradictory as well: while in some studies significant differences have been identified between kindergarten and elementary school children with TD and LI (who have no delay of nonverbal intelligence) in the amount of story information in self-generated (Schneider et al., 2006; Wagner et al., 1999) and retold stories (Wagner et al., 1999), there are also contradictory results that do not confirm these findings in self-generated stories (Norbury & Bishop, 2003). The discrepancies between the results may be due not only to different scoring systems and the broad heterogeneity of narrative skills of children with LI but also to differences in story elicitation context in terms of the content and structure of stimulus materials, story eliciting method (story generation or retelling), and story modeling (which was carried out in studies of Schneider et al. and Wagner et al. but not in Norbury and Bishop).

With regard to evaluation, the results are contradictory as well: while in some studies, significant differences have been found in self-generated (Reilly et al., 2004; Ukrainetz & Gillam, 2009) and retold narratives (Sleight & Printz, 1985), there are also findings with no such difference between self-generated stories of children with TD and LI (Norbury & Bishop 2003). Similar to the studies of SG organization, discrepancies in the findings in use of evaluative devices may be due to several factors, including differences in story stimuli as well as in story elicitation contexts in these studies.

Concerning narrative microstructure, the results of the clinical utility of narratives are also mixed. For example, some researchers (Pearce et al., 2003; Peña et al., 2006; Scott & Windsor, 2000; Wagner et al., 1999) have demonstrated that children with LI produce significantly shorter stories than their peers without disabilities. By contrast, other research (Fey et al., 2004; Norbury & Bishop, 2003) has not found the length of narratives to be a sensitive variable for distinguishing children with different language competences. In addition, Merritt and Liles (1987) and Wagner et al. (1999) agree in their caution for overgeneralization concerning this characteristic because this measure does not reflect the quality of the content of the story because children with language disorders often produce extraneous utterances that include irrelevant information.

Sentence-level measures, by contrast, have been proposed as particularly valuable for clinical use (Liles et al., 1995; Norbury & Bishop, 2003). For instance, mean length of utterances in words differentiates kindergarten and elementary school children with TD from those with LI, both in self-generated stories (Bishop & Donlan, 2005; Fey et al., 2004; Scott & Windsor, 2000) and retold narratives (Hayward et al., 2007). However, the findings of Fey et al. (2004) indicate that the clinical utility of mean length of utterances decreases as children grow older. Grammatical errors is another widely suggested measure in differentiating children with LI (Fey et al., 2004; Norbury & Bishop, 2003; Pearce et al., 2003; Reilly et al., 2004; Scott & Windsor, 2000). In addition,

cohesion in terms of accurately used cohesive devices has been found to be significantly different in self-generated and retold stories of children with LI and TD (Liles, 1987; Miranda et al., 1998; Ripich & Griffith, 1988). Thus, sentence-level measures of narratives are found to be valuable in differentiating stories of children with LI from those with TD. However, due to lack of comparable studies carried out in different story elicitation contexts, it is not known if applying any of these story eliciting methods (retelling or generation, generation with or without previously modeled story) enables better differentiation of the narratives of children with different language competences.

To sum up, narrative assessment has been widely used as part of language assessment in clinical practice, showing language and cognitive difficulties of children with LI in the storytelling process. However, as findings of the narrative macrostructure of children with TD and LI have brought forth contradictory results, the clinical utility of narrative assessment has been questioned. These discrepant results may be related to different story eliciting methods applied in the studies. Clarification of the effect of story eliciting methods on children's narration is needed to choose a more reliable assessment tool in clinical practice.

### **I.5. Narrative as a Tool Identifying Children who are at Risk for Reading Difficulties**

The ultimate aim of reading is comprehension. Besides skills associated with word decoding, several oral language abilities at the word, sentence, and discourse levels have been found to contribute to reading comprehension (see Cain & Oakhill, 2007). Oral language skills that contribute to reading comprehension, particularly those at the discourse level are often measured with production tasks (Paris & Paris, 2003). The reason is that discourse production procedures (elicited either by retelling or generation tasks) have been found to correlate well with other measures of discourse comprehension and comprehension in general (Skarakis-Doyle & Dempsey, 2008), and these relations, together with word decoding, describe well the basis of reading comprehension (see Cain & Oakhill, 2007). Discourse production tasks are often carried out with narratives because children are most familiar with this genre and oral narration shares many common properties with written text such as monologue language form, concise and complex syntactic structure, unfamiliar and abstract vocabulary, and decontextuality (Roth, Speece, & Cooper, 2002). Research has shown that the importance of discourse-level skills in reading comprehension gradually increases during the course of development when word decoding becomes more efficient (see Oakhill & Cain, 2007).

Storytelling skills have been found to contribute to reading comprehension in several macrostructural aspects. For example, children's abilities to structure their own stories (Cain, 2003; Cain & Oakhill, 1996; Chang, 2006; Griffin et al., 2004), to represent adequately the content of the discourse (Feagans & Appelbaum, 1986; Griffin et al., 2004; Hagtvet, 2003; Pankratz, Plante, Vance, & Insalaco, 2007), and to mark the significance of narrated events through the use of evaluation (Griffin et al., 2004) have been indicated as causally related to their reading comprehension. However, the majority of studies have used only one method to elicit stories, except the studies of Cain and Oakhill (1996) and Cain (2003) in which the effect of several types of prompts (picture sequence and story title) on the structure of the self-generated stories of children with typical and poor reading comprehension skills was examined. The authors found that children with weak reading comprehension skills produced stories that were poorer in terms of structural coherence when little external aid (i.e., story title) was provided.

Although there is evidence that sentence-level skills in terms of syntactic comprehension predict children's reading comprehension (see Cain & Oakhill, 2009; Oakhill & Cain, 2007), sentence production skills, measured in the context of storytelling have not been found to contribute significantly to reading comprehension, neither in story retelling (Feagans & Appelbaum, 1986) nor in story generation (Griffin et al., 2004). However, lack of substantial evidence does not enable researchers to draw conclusions about the sensitivity of grammaticality measures in identifying the types of linguistic deficits that characterize children who are at risk for reading comprehension difficulties. Concerning cohesion, a significant relation between the use of interclausal connectives in retold (Yuill & Oakhill, 1991 [as cited in Cain, 2003]) as well as in self-generated stories (Cain, 2003) and reading comprehension has been identified. Cain (2003) also found that connective usage by children with poor reading comprehension skills was affected by story eliciting prompts being scarce and less adequate when little external support was provided.

In sum, research has indicated significant relationships between some narrative skills at the macro- and microstructure levels (in terms of cohesion) and reading comprehension, whereas the strength of the relationship increases alongside the development of the child. Moreover, narrative skills have been found to be causally implicated in the development of reading comprehension skill. However, there is lack of knowledge about the advantages of story eliciting methods when using narrative assessment for identifying children who are at risk for reading comprehension difficulties.

## 2. THE AIMS AND RESEARCH QUESTIONS

The general aim of this doctoral dissertation was to develop and test an assessment tool of narrative production skills of Estonian school beginners which might be used by speech-language therapists and special education teachers for screening children with LI and at risk for reading difficulties. Identifying children who have or are at risk for difficulties in oral and/or written language development at school beginning is necessary as the first step in the process of language intervention which, in turn, is crucial for their academic success. In addition, information about a child's actual narrative production skills enables educators and researchers to develop effective teaching of narrative structure. The instrument consists of three original picture sequences and two narrative texts. Children's stories were elicited by three methods, i.e. narrative self generation without previous model story, narrative retelling, and narrative self generation with previous model story. Narratives were analyzed for macrostructural and microstructural measures described below.

The specific aims of the dissertation were (1) to describe Estonian children's picture-elicited oral fictional narratives at macrostructural and microstructural levels at the beginning of elementary school, (2) to find out which type of narrative, elicited with three different methods, enables evaluators to best differentiate children with LI, and (3) to find out which type of narrative, elicited with the three different methods, best predicts reading comprehension in the first grade.

Based on the aims, research questions were as follows.

1. What is the macrostructure of self-generated narratives in terms of presence of SG components of 6–7 year old Estonian children?
2. How are the narrative measures at macrostructure and microstructure levels related to each other?
3. How do the measures of macrostructure of narratives (presence of SG components, story information units, index of narrative complexity), elicited under three task conditions, differentiate children with different language competences?
4. How do the measures of microstructure of narratives (total number of words, the mean length of C-units and grammatical errors), elicited under three task conditions, differentiate children with different language competences?
5. How do the macrostructure and microstructure measures of narratives, produced by 6–7 year old children under different task conditions, contribute to their reading comprehension one year later when the children are at the end of the first grade of elementary school?

## 3. METHOD

### 3.1. Participants

A total of 279 children participated in Studies I–IV. The native language of all children was Estonian. The majority of the children (participants in Studies I–IV, called *the control group* in Study I and *children with typical language development* in Study III) were tested twice. The first assessment was carried out at the end of the last kindergarten year (April–May) when they were 6–7 years old. The children were tested for several cognitive and language abilities, including narrative production skills in 21 kindergartens from six counties in Estonia. Information about the children’s abilities came also from kindergarten teachers who were asked to complete a questionnaire about various aspects of the children’s competencies, including language skills (reading and storytelling). Teachers were asked to evaluate each child’s skills on a three-point scale with a range of low, average, and high. According to the teachers’ evaluations, the children were divided into three language competence groups: high (HLC), average (ALC), and low (LLC). Additional information about the children’s language development or disabilities was not available for this study. The children’s reading comprehension was assessed one year later, i.e. at the end of the first grade (Study IV).

The other part of the sample consisted of children with LI (Studies I and III). All the children had been diagnosed by speech-language therapists as having LI. In addition, they were diagnosed by psychiatrists according to the *ICD-10 Classification of Mental and Behavioral Disorders* (World Health Organization, 1992). The children met the criteria for expressive language disorder (F80.1), receptive language disorder (F80.2), and mixed specific developmental disorders (F83). Children who had mental retardation, hearing disorders, or neurological diseases were excluded from the studies. The age of the LI children in Studies I and III was 6–8 and 6–7 years, respectively. All the children went to a school for students with LI in South-Estonia. The children with LI were tested for their narrative production skills at the beginning of the first grade (in September).

In all studies, informed parental consent was obtained for each child. Parents received letters in which the aims of the study were described. Only children whose parents allowed their children to participate in the study were included.

The samples in the studies are described as follows (see also Table 1).

In **Study I**, the total sample consisted of 234 children. Two hundred sixteen children (age 6–7; 102 boys and 114 girls) belonged to the control group, and 18 children with LI to the clinical group (age 6–8; ten boys and eight girls). The control group was divided into three language competence subgroups, based on their teachers’ evaluations: children with HLC ( $n = 81$ ), ALC ( $n = 106$ ), and LLC ( $n = 29$ ). The clinical group consisted of six children with expressive

language disorder (F80.1), five children with receptive language disorder (F80.2), and seven children with mixed specific developmental disorders (F83).<sup>1</sup>

In **Study II**, the total sample consisted of 252 children (age 6–7; 124 boys and 128 girls). Like in Study I, teachers' evaluations of the children's language competences were taken as basis of dividing the children into the subgroups. According to teachers' ratings (available for 216 children), the sample consisted of children with HLC ( $n = 81$ ), ALC ( $n = 106$ ), and LLC ( $n = 29$ ).

In **Study III**, the total sample consisted of 189 children (age 6–7). One hundred sixty-two children were considered TD (72 boys and 90 girls) and 27 children had LI (16 boys and 11 girls). The children with TD were evaluated by their teachers as having high or average language competences; children who had been evaluated as having low level of language competences were excluded from the study. The LI group consisted of children who met the criteria for expressive language disorder (F80.1;  $n = 13$ ), receptive language disorder (F80.2;  $n = 7$ ), and mixed specific developmental disorders (F83;  $n = 7$ ).

In **Study IV**, the sample consisted of children who participated in the one-year longitudinal study. The children were first tested at the end of kindergarten (age 6–7) for narrative production skills, phonological awareness, and vocabulary knowledge. At the end of the first grade (age 7–8), children's reading comprehension was assessed. The number of children taking all the tests in kindergarten (i.e., narrative assessment, tests of phonological awareness and vocabulary knowledge) was 157, and those who completed all the tests in kindergarten as well as reading comprehension test in the first grade was 125. The gender distribution remained stable during the study (41–42% of boys and 58–59% of girls).

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<sup>1</sup> In the present work, results of Study I are presented only for the control group children (i.e., those with HLC, ALC and LLC).

**Table 1.** Overview of the samples, story eliciting methods, narrative measures, and other language skills in Studies I–IV

Studies	<i>N</i>	LLC <i>n</i>	ALC <i>n</i>	HLC <i>n</i>	LI <i>n</i>	Story eliciting method	Narrative measures	Other variables
Study I	234	29	106	81	18	- NG no Model	- SG components - SG score	-
Study II	252*	29	106	81	-	- NG no Model	- SG components - SG score - TNW - MLCU - GE	-
Study III	189	-	162**	27	-	- NG no Model - NR - NG with Model	- SG score - INC - MLCU - GE	-
Study IV	157***				-	- NG no Model - NR - NG with Model	- SG score - INC - MLCU - GE	- PA - VK - RC

*Note 1.* LLC = low language competence; ALC = average language competence; HLC = high language competence; NG no Model = narrative generation without previous model story; NR = narrative retelling; NG with Model = narrative generation with previous model story; SG components = presence of story grammar components; SG score = story grammar score; TNW = total number of words in narrative; MLCU = mean length of C-units; GE = grammatical errors; INC = index of narrative complexity; PA = phonological awareness (assessed in kindergarten); VK = vocabulary knowledge (assessed in kindergarten); RC = reading comprehension (assessed in the first grade).

*Note 2.* \* – the total sample, consisting of the children whose language competence was evaluated by their teachers ( $n = 216$ ) and those whose language competence was not known ( $n = 36$ ); \*\* – children with typical language development (evaluated as having average or high language competence by their teachers); \*\*\* – the sample size of children who participated in the longitudinal study was 125.

### 3.2. Assessment of Narrative Production Skills

**Description of stimulus materials.** For the purpose of assessing children’s narrative production skills, the original stimulus material was developed by Piret Soodla, Marika Padrik, Merit Hallap, and Kati Mäesaar. The assessment material included three picture sequences and two narrative texts. To enable reliable and valid scoring of the stories, it was important that the stimuli clearly depicted stories that fit some model of a good story. We designed the materials



according to the SG model (Stein & Glenn, 1979), taking the instrument developed by Schneider, Dubé and Hayward (2005) as an example. The picture sequences were designed to elicit single-episode stories and consisted of five pictures which depicted the following events related to SG components: setting, initiating event, internal response, internal plan, attempt, consequence, and reaction. The pictures were drawn and colored by a professional artist, Jolana Laidma. The surroundings, objects, and activities depicted in the pictures were intended to be familiar to the children. The three picture sequences reflected an episode about a girl and a boy who were sledding, a girl and a dog who were playing ball, and a girl and a boy who were building a snowman (for reduced grayscale copies of the picture sequences, see Appendix A).

Two narrative texts were composed, one for the picture sequence about the ball game and another for the sequence about the snowman. As with the picture sequences, the SG model was taken into account in the construction of verbal texts in which information of all the SG components were included explicitly. The stories were examples of good narratives in terms of macrostructural and microstructural features, including all SG elements, elements of expressive elaboration, accurate grammar, and diverse cohesive markers. The number of words in the texts about the ball game and the snowman were 136 and 145, the quantity of story information units was 20 and 21, and the indices of narrative complexity were 20 and 21, respectively. The mean length of sentences was six words in both texts. For coding of the narrative measures, see below.

**Procedure.** The assessment of narrative production was carried out individually in a separate room in children's kindergartens or school (with LI children) by several examiners. Each child was presented with three different picture series and told three narratives, respectively. For all the children, the basis of the first narrative was the sequence about sledding. The picture material of the second and the third story varied; for half of the children ( $n = 98$  in Study III;  $n = 101$  in Study IV), the basis of the second and the third narrative was the ball game and the snowman, respectively. For the rest of the children ( $n = 91$  in Study III;  $n = 93$  in Study IV), the order of these picture sequences was the opposite. The picture sequences for the second and third story were counterbalanced to eliminate the possible effect of concrete sequence content. Narratives were elicited with story eliciting methods in the following format.

1. *Narrative generation without previous model story.* The examiner and the child sat face-to-face across a table. The examiner told the child that she had several pictures which the child could use to make a story. The examiner placed the first picture of the series on the table and said that this was the first picture of the story. The examiner then placed the other four, in an incorrect order, on the table. The examiner asked the child to set the rest of the pictures in the right order. If the child ordered the pictures differently from the expected order, the examiner re-set the sequence correctly. This procedure ensured that children had carefully examined all the pictures and tried to create the schema before telling the story. The child could look at the whole set as long as he or she

wished. When the child was ready, the examiner asked him or her to tell a story based on the sequence. The examiner also stressed that she did not see the pictures well and wished to audiotape the child's story. This circumstance allowed the examiner to ask the child to tell the story clearly and to make the story understandable. This remark was used for establishing a story eliciting context not shared between the child and the examiner. After these instructions, the child told the story while looking at the pictures.

2. *Narrative retelling.* After the first storytelling, the examiner asked the child to look at the pictures and listen to the next story that she would narrate to the child. She also explained that the child should retell the story afterwards. The examiner placed the pictures on the table and at the same time read the story to the child. After the storytelling, the child could look at the whole set as long as he or she wished and was asked to tell the story according to the pictures. Again, the child was asked to tell the story as clearly as possible. During the retelling, the picture sequence was on the table in front of the child.

3. *Narrative generation with previous model story.* The story eliciting procedure was similar to that of the narrative generation without previous model story (first narrative). The only difference lay in the context of story modeling: the story (told by the examiner) on which the retold narrative was based provided the model story for the third narration.

In Studies I and II, narratives elicited only by method of narrative generation without previous model story were analyzed. In Studies III and IV, stories elicited by all three methods were examined (see Table 1).

**Transcription and coding of narratives.** The narratives were transcribed word for word by four examiners – Piret Soodla, two master's graduates of special education, and an experienced speech-language therapist. Comments to the examiner that did not develop the story (e.g., "Now I start" or "What's his name?") and mazes (e.g., nonlinguistic vocalizations, repetitions, false starts, and abandoned utterances) were excluded from the analysis.

The macrostructure of the narratives was analyzed in following three ways.

1. *The presence of SG components.* This coding method showed whether each SG component (i.e., setting, initiating event, internal response, internal plan, attempt, consequence, reaction) was mentioned in the story or not. Evaluating the presence of SG components reveals patterns of story macrostructure as well. The measure was used in the analysis of narrative macrostructure in Studies I and II.
2. *Quantity of story information units.* Stories were also coded for story information units, defined as central story information (see Hayward & Schneider, 2000). The coding method was based on the SG model (Stein & Glenn, 1979), which ascertained whether the children's story information was central. Each SG component was coded for story information units, depicting relevant information of the component. Finally, all the points calculated for each SG component were added up for the quantity of story information units (SG score), indicating the

amount of relevant information in the story. For a detailed description and examples of the coding method, see Study I. SG score was used in narrative macrostructural analysis in all studies (Studies I–IV).

3. *Index of narrative complexity (INC)*. INC, originally developed by Petersen, Gillam, and Gillam (2008) integrates existing research and approaches related to the assessment of structural aspects of oral narratives. Foundational to the INC are the SG analysis (Stein & Glenn, 1979) and the high point analysis (Labov & Waletzky, 1967/1997; Peterson & McCabe, 1997). INC includes categories for rating the complexity of characters, setting, initiating events, internal responses, plans, action/attempts, complications, consequences, narrator evaluations, story appendages, temporal markers, and causal adverbial clauses. The categories included in INC are differentially weighted in favor of episodic complexity and narrative cohesion. Thus, INC is related to narrative macrostructure and those microstructural devices that strongly interact with macrostructure. In the present work (Studies III and IV), the coding of INC is adapted for the Estonian language (see Appendix B).

The microstructure of the narratives was analyzed for productivity and grammaticality in terms of mean length of utterances (i.e., C-units) and grammatical errors.

1. *Productivity* was measured by the total number of words in each story (analyzed in Study II).
2. *The mean length of C-unit (MLCU)*. C-unit was defined as the independent clause and all of its modifiers, according to Loban (as cited in Hughes et al., 1997). MLCU was a ratio of total number of words in text divided by total number of C-units. MLCU was measured in Studies II–IV.
3. *Grammatical errors*. The measure was calculated as a ratio of total number of grammatical errors divided by the number of words in text. Misuse of word ordering as well as omission and misuse of obligatory parts of sentence were counted as grammatical errors. Grammatical errors were examined in Studies II–IV.

**Coding reliability.** For interrater reliability, a part of narrative samples were coded by several examiners. Coding reliability was calculated for the presence of SG components (using Cohen's kappa), SG score (using point by point agreement in Study I, and Spearman rank-order correlation in Studies II–IV), INC (Spearman rank-order correlation), and grammatical errors (Spearman rank-order correlation). For the narrative macrostructure measures, agreement rates were high ( $\kappa = .92$  and  $r_s > .80$ ). For grammatical errors, correlations between judges differed in Study II ( $r_s = .84$ ) and Studies III–IV ( $.56 < r_s < .62$ ).

### 3.3. Assessment of Other Language Skills

In Study IV, in addition to narrative production skills, phonological awareness and vocabulary knowledge was assessed at the end of kindergarten. At the end of the first grade, the children's reading comprehension was assessed.

**Phonological awareness.** Phonological awareness was assessed via a group test of phonemes (Männamaa & Kikas, 2011). The child was provided with a series of four pictures. For each series, the examiner named all the words shown in the pictures and asked the child to check off the picture in which he or she heard the particular phoneme. For example, "In the pictures there are a horse [*hobune*], a boat [*paat*], a window [*aken*], and a bottle [*pudel*]. Check off the picture in which you hear the sound *k*". The position of the sound in the words mentioned by the examiner varied (in the beginning, in the middle, or at the end of the word). The test comprised a sample item and 15 test items. Internal reliability of the test was good (Cronbach  $\alpha = .90$ ).

**Vocabulary knowledge.** Seventeen items from the test of concepts (Männamaa & Kikas, 2011) were used to measure vocabulary knowledge of the children and were administered as a group test. The child was asked to find and mark the picture among the presented pictures which corresponded with the instruction read by the examiner. The instructions included the concepts of time, number, and space. For example, "Check the picture with the *oldest* child," "Check the picture with *more* balls," "Check the picture with the girl who stands *behind* a boy." The test assesses children's understanding of words that correspond to concepts demonstrated in the pictured situations. Internal reliability of the test was acceptable ( $\alpha = .62$ ).

**Reading comprehension.** Assessment of reading comprehension at the end of the first grade was carried out in a whole-class context by the class teachers as one part of the Estonian language test (Häidkind, Kikas, Henno, & Peets, in press). The reading text was in the narrative genre, consisting of seven sentences (38 words). The children were asked to read a text and then to answer five questions based on the story. Two questions required understanding of the explicit information included in the text, and three questions required making inferences from the text. The children were able to see the text for the entire duration of the task. Internal reliability of the test was good ( $\alpha = .75$ ).

### 3.4. Data analyses

The analyses were performed using the software package Statistica 7 (StatSoft, Inc., 2002). In addition, the statistical package Mplus-6 (Muthén & Muthén, 1998–2010) was used in Study IV. The significance level of the tests for declaring a probability value as significant was set at .05. Various statistical methods were used in Studies I–IV and are described in the related publications.

## **4. RESULTS AND DISCUSSION**

### **4.1. Presence of Story Grammar Components in the Self-Generated Narratives**

In order to compose a description of the structural pattern of Estonian children's stories, self-generated narratives elicited without previous model story were analyzed in terms of the presence of SG components (Study I and II). The sample consisted of those children who were tested in kindergarten and were divided into three language competence groups according to their teachers' evaluations. Results indicated that large majority of the stories involved initiating events (nearly 100%), attempts (99%), and consequences (89%), and the presence of these components was high in stories of all language competence groups. The setting component was present in half (51%) of the narratives, being higher in HLC group (64%) than in ALC (43%) and LLC groups (41%). Categories depicting characters' emotional states – internal responses and reactions – were present in 22% and 17% of the stories, respectively, and the inclusion of these components were similar in all groups. The analyses showed that the children did not usually mention characters' plans to reach the goal; only one child mentioned that aspect explicitly.

The results were consistent with those of earlier studies that examined the macrostructure in stories of English-speaking children (e.g., Merritt & Liles, 1987; John et al., 2003), showing that the majority of the studied Estonian children with different levels of language competence were capable of producing structurally complete stories, including at least three main SG components – the initiating event, the attempt, and the consequence. The results also indicated that inclusion of information depicting the setting category and the characters' internal states were much rarer in children's narratives by the age of 6–7 years. Although our studies were not cross-cultural, similar results of stories of Estonian children and their peers in other European-based (mainly English-speaking) cultures support the findings that storytelling skills at the narrative macrostructure level are strongly related to a child's age (John et al., 2003; Merritt & Liles, 1987; Muñoz et al., 2003; Nelson, 1996; Schneider et al., 2005; Stein & Glenn, 1979) as well as the cultural context in terms of storytelling traditions, values, and forms (Stein, 2004; Stein & Glenn, 1979; Westby et al., 2002).

## 4.2. Relations between Narrative Macrostructure and Microstructure Measures

To answer the question, how were the narrative measures at the macrostructure and microstructure levels related to each other, correlational analysis (in Studies II and IV) and group comparisons using one-way ANOVA (in Study II) were carried out. The quantity of story information units (SG score) and INC (only in Study IV) were used as the macrostructural measures; the number of words (only in Study II), the mean length of C-units, and grammatical errors were measures at the microstructure level. Only stories of children who were tested in kindergarten were included in the analysis.

The expected outcome was weak to moderate correlations between the narratives' macrostructural and microstructural measures as found in previous studies (Liles et al., 1995; Stein & Albro, 1997; Wagner et al., 1999). The results were in accordance with that expectation, showing weak correlations between macrostructural measures (SG score and INC) and microstructural measures (i.e., MLCU and grammatical errors) with the correlation coefficients between .06 and .28 in all stories, elicited with three different methods. The only exception was a high correlation between story length and SG score,  $r = .57, p < .05$  (calculated only in self-generated narratives without previous model story in Study II).

In addition to correlational analysis, group comparisons were carried out (in Study II). The children were divided into three groups, according to their narratives' quantity of story information units into those whose stories had low, average, and high SG scores. Differences between these groups were examined for the MLCU and grammatical errors. Analyses showed significant differences between the groups, both for the MLCU ( $F(2,249) = 8.68, p < .001$ ) and grammatical errors ( $F(2,249) = 6.40, p = .002$ ). Post hoc comparisons indicated that children whose stories were least informative produced significantly shorter C-units and made significantly more grammatical errors than children whose SG score was average or high. This relation between macrostructural and microstructural measures did not occur when comparing narratives of children whose stories included average and high quantity of story information units, neither for the mean length of C-units nor grammatical errors. The finding indicates that poor narrative ability is related to low levels of skills both at macrostructure and microstructure levels. This supports the argument that, in narrative assessment, measures of both levels should be taken into account (Gillam & Pearson, 2004; Haynez & Pindzola, 2008; Hughes et al., 1997).

### 4.3. Relations between Children’s Narrative Macrostructure, their Language Competence and Story Eliciting Methods

Three measures of narrative macrostructure were used when comparing stories of children with different language competences: the presence of SG components (in Studies I and II), the SG score (in Studies I–III), and the INC (in Study III). In Studies I and II, only self-generated narratives without previous model story were analyzed. In Study III, narratives elicited by three methods (narrative generation without previous model story, narrative retelling, and narrative generation with previous model story) were examined.

**The presence of SG components.** Considering the presence of SG components, stories of children with different language competences were compared, using two-tailed Fisher’s exact probability test. Comparing narratives of children with HLC, ALC and LLC, results showed that stories in these groups differed only by the setting component, indicating a significant difference between stories of HLC and ALC children ( $p = .005$ ,  $OR = 2.34$ ), as well as HLC and LLC children ( $p = .048$ ,  $OR = 2.54$ ). LLC and ALC groups did not differ for the setting component ( $p = 1.0$ ,  $OR = 1.09$ ).

In summary, only the presence of the setting component was a significant category for differentiating between the stories of the language level groups. However, the presence of this component differentiated only stories of children with HLC but not between the children with ALC and LLC. This finding suggests that coding method of narrative macrostructure in terms of the presence of SG components is not meaningful for identifying children whose language development is impaired, at least at the ages of 6–7 years when eliciting self-generated narrative without previous model story. However, identifying SG components is necessary as the first step in other methods of narrative macrostructure assessment that are based on SG model (e.g., Norbury & Bishop, 2003; Schneider et al., 2005; Wagner et al., 1999). In addition, information about a child’s story knowledge in terms of inclusion of SG components in his/her stories is useful for narrative intervention (see Boudreau, 2008).

**The quantity of story information units.** SG score was analyzed for two comparisons: first, for HLC, ALC, and LLC groups in self-generated narratives without previous model story (in Studies I and II), and second, for children with TD and those with LI in all three narratives (Study III).

The results showed that self-generated narratives without previous model story of children with HLC, ALC and LLC included different quantities of central information; the higher the language competence was, the more central information the story included. The one-way ANOVA showed significant effect of language competence on SG score,  $F(2, 213) = 7.71$ ,  $p < .001$ ,  $\eta^2 = .07$ . Post hoc analyses indicated that the narratives of children with HLC consisted of

significantly more story information units than the stories of LLC children ( $p < .001$ ,  $d = 0.90$ ), but the differences between the HLC and ALC groups, and likewise the ALC and LLC groups, were borderline but not statistically significant (HLC – ALC:  $p = .051$ ,  $d = 0.34$ ; ALC – LLC:  $p = .083$ ,  $d = 0.52$ ).

Comparing stories, elicited by three methods of TD and LI children, repeated measures ANOVA was used through which the main effects of the story eliciting method and the language competence group as well as the interaction of these effects on SG score were analyzed. Analysis revealed significant main effects of the language competence group ( $F(1,187) = 44.34$ ,  $p < .001$ ,  $\eta_p^2 = .19$ ) and the story eliciting method ( $F(2,374) = 41.48$ ,  $p < .001$ ,  $\eta_p^2 = .18$ ), and interaction between these effects on SG score,  $F(2,374) = 8.48$ ,  $p < .001$ ,  $\eta_p^2 = .04$ . A post hoc test indicated significant differences between TD and LI groups in retold narratives ( $p < .001$ ,  $d = 1.43$ ) and self-generated narratives with previous model story ( $p = .018$ ,  $d = 0.99$ ). In self-generated narratives without model story, the difference was not significant. Analysis showed also that in group of TD children, the SG score was significantly higher both in the retold and self-generated narratives with previous model story than in self-generated narratives without model story ( $p < .001$ ,  $d = 1.43$ ;  $p < .001$ ,  $d = 0.44$ , respectively). In LI group, these differences did not reach the level of significance.

To sum up, the SG score differentiated between children with different language competences, especially, between children with LI and those with TD. The finding supports the use of the SG score as a clinical tool for narrative assessment. The effect of the story eliciting method on the quantity of story information units included in narratives was significant only for TD children whose retold stories and self-generated narratives with previous model story were more informative than self-generated narratives without previous model story. Children with TD benefitted more from the model story, especially when retelling but also when generating narratives than children with LI did. This finding supports viewpoint of Merritt and Liles (1987, 1989) that although story generation and story retelling are both effective measures of narrative ability, there are some advantages for using retelling tasks in clinical assessment. In our study, the advantage lies in better discrimination of LI children from their typically developed peers when using retold stories in narrative assessment, as compared to self-generated stories. The finding also points to the advantage of using previously modeled stories in language assessment as compared to stories elicited without previous model stories.

**The index of narrative complexity.** The INC was examined using repeated measures ANOVA where the main effects of the story eliciting method and the language competence group (TD, LI) as well as the interaction of these effects on INC were calculated. Due to significant differences between the INC of stories elicited by picture sequences about the ball game and the snowman, both in the retold and self-generated narratives with previous model story, the analyses were carried out in two separate groups. In group A, the order of the



second and third picture sequences was *Ball game* and *Snowman*, respectively. In group B, the order of the second and third stimuli was reversed. Analysis revealed the main effects of the language competence group (A:  $F(1,96) = 30.13, p < .001, \eta_p^2 = .24$ ; B:  $F(1,89) = 13.93, p < .001, \eta_p^2 = .14$ ) and the story eliciting method (A:  $F(2,192) = 62.97, p < .001, \eta_p^2 = .40$ ; B:  $F(2,178) = 48.34, p < .001, \eta_p^2 = .35$ ). The interaction effect of the language competence group and the story eliciting method was significant in group A ( $F(2,192) = 5.71, p = .004, \eta_p^2 = .06$ ) but not in group B ( $F(2,178) = 2.39, p = .095, \eta_p^2 = .03$ ). In group A, the INC differed significantly between TD and LI children in retold narratives ( $p < .001, d = 1.71$ ) and in self-generated narratives with previous model story ( $p = .009, d = 1.67$ ) but not in self-generated narratives without model story. In group B, the difference was significant only in retold narratives ( $p = .021, d = 1.01$ ). Analysis showed also that in group of children with TD, the INC was significantly higher in the retold ( $p < .001, d > 1.74$ ) and self-generated narratives with previous model story ( $p < .001, d > 0.81$ ) than in self-generated narratives without model story. In LI group, the INC was significantly higher in retold narratives as compared to that in self-generated narratives without previous model story ( $p < .05, d > 1.44$ ). Comparing the INC between self-generated narratives with and without previous model story, a significant difference was observed in group B ( $p = .023, d = 1.43$ ) but not in group A.

To sum up, the INC differed significantly between children with TD and LI in retold stories. In self-generated narratives with previous model story the group difference was significant in one comparison, and no differences were observed in self-generated narratives without previous model story. The effect of the story eliciting method was observed only for TD children whose INC in the retold and self-generated narratives with previous model story was significantly higher than in narratives elicited without previous model story. These findings support the use of the INC as clinical tool for narrative assessment. The findings also highlight the advantage of story retelling over story generation tasks in the assessment of narrative skills in clinical practice. In narrative generation procedures, providing a model story before storytelling is recommended, according to the results.

#### **4.4. Relations between Children’s Narrative Microstructure, their Language Competence and Story Eliciting Methods**

Three measures of narrative microstructure were analyzed when comparing stories of children with different language competences: total number of words in each story as the measure of productivity (only in Study II), mean length of C-units, and grammatical errors as measures of grammaticality (Studies II and

III). In Study II, only self-generated narratives without previous model story were analyzed. In Study III, narratives elicited by three methods (narrative generation without previous model story, narrative retelling, and narrative generation with previous model story) were examined.

**Productivity.** The total number of words in self-generated narratives without previous model story was compared between children with HLC, ALC, and LLC, using one-way ANOVA. The results showed that stories of children in these groups were similar in length,  $F(2,213) = 0.22, p = .801$ . At the same time, variety in productivity was remarkably greater in the LLC group than among HLC and ALC children.

This finding agrees with those of Norbury and Bishop (2003) and Fey et al. (2004), that narrative length does not distinguish children by their language competence; children with language difficulties may generate stories as lengthy as their peers whose language competence is higher.

**Mean length of C-units.** MLCU of stories was examined in two comparisons: first, for HLC, ALC, and LLC groups in self-generated narratives without previous model story (in Study II) and, second, for children with TD (HLC and ALC children) and those with LI in all three narratives (Study III).

The MLCU was related to the language groupings of the children, according to their teachers' evaluations: the higher the language competence was, the more words were included in C-units. The one-way ANOVA revealed significant differences between the groups,  $F(2,213) = 3.56, p = .030$ . Post hoc tests indicated a statistically significant difference between the LLC and HLC groups ( $p = .025$ ), a marginal difference between the LLC and ALC groups ( $p = .099$ ), and no significant difference between the ALC and HLC groups. The greatest variety in the MLCU occurred in the LLC group.

The second comparison was made for narratives, produced under three different task conditions by children with TD and LI. The analysis was carried out, using repeated measures ANOVA through which the main effects of the story eliciting method and the language competence group as well as the interaction between these effects on the MLCU were calculated. Analysis revealed a significant main effect of the language competence group on the MLCU ( $F(1,187) = 56.12, p < .001, \eta_p^2 = .23$ ). Post hoc tests indicated that the MLCU differed significantly between TD and LI children in all narratives, elicited with three different methods ( $p < .01, d > 0.89$  in all comparisons). Neither the main effect of the story eliciting method ( $F(2,374) = 1.23, p > .05, \eta_p^2 = .01$ ) nor the interaction effect of the language competence group and the story eliciting method ( $F(2,374) = 2.26, p > .05, \eta_p^2 = .01$ ) on the MLCU were observed.

In summary, our findings suggest that the MLCU is significantly related to children's language competence; longer MLCU in stories of children whose level of language development is higher than those who have difficulties in language development. The results also support usage of MLCU as a measure of grammaticality of narrative in the Estonian language when identifying

children with LI, similar to previous research, carried out with English-speaking children (Scott & Windsor, 2000; Bishop & Donlan, 2005; Hayward et al., 2007). Considering MLCU, all three story eliciting methods (narrative retelling and narrative self-generation with and without previous model story) are appropriate for narrative assessment for clinical purposes.

**Grammatical errors.** Grammatical errors as the other measure of grammaticality of a narrative was also examined in two comparisons: first, for HLC, ALC, and LLC groups in self-generated narratives without previous model story (in Study II), and, second, for children with TD (HLC and ALC children) and those with LI in all three narratives (Study III).

The results indicated that the occurrence of grammatical errors in self-generated narratives without previous model story was significantly related to the language groupings of the children, according to their teachers' evaluations: the higher the language competence was, the less errors were included in the stories. The group differences were statistically significant,  $F(2,213) = 13.20$ ,  $p < .001$ . Post hoc tests revealed the group effect for all three comparisons: LLC and ALC groups ( $p = .021$ ), LLC and HLC groups ( $p < .001$ ), and ALC and HLC groups ( $p = .003$ ).

Comparing TD and LI children's stories that were elicited with different methods, repeated measures ANOVA was carried out through which the main effects of the language competence group and the story eliciting method and the interaction between these effects on grammatical errors were calculated. Analysis revealed the main effects of language competence group ( $F(1,187) = 123.98$ ,  $p < .001$ ,  $\eta_p^2 = .40$ ) and story eliciting method ( $F(2,374) = 11.70$ ,  $p < .001$ ,  $\eta_p^2 = .06$ ) as well as the interaction between these effects,  $F(2, 374) = 4.62$ ,  $p = .011$ ,  $\eta_p^2 = .02$ . Post hoc tests showed significant differences between TD and LI groups in all three narratives,  $p < .001$ ,  $d > 0.8$ . Narratives of TD children, elicited with different methods, were similar in grammatical accuracy,  $p > .05$ ,  $d < 0.28$ . In the group of LI children, the frequency of grammatical errors was significantly higher in self-generated narratives without previous model story than in narratives elicited with methods of retelling and story generation with previous model story ( $p < .01$ ,  $d > 0.37$  in both comparisons).

Our findings indicate that occurrence of grammatical errors is significantly related to the child's language competence, errors being less frequent in stories of children whose level of language development is higher than those who have difficulties in language development. Significant and large differences between the studied stories produced by Estonian children with TD and LI in terms of grammatical accuracy also support findings of previous research, carried out in the context of the English language (Fey et al., 2004; Norbury & Bishop, 2003; Pearce et al., 2003; Reilly et al., 2004; Scott & Windsor, 2000) that supports grammatical errors as a measure of narrative microstructure as valuable in language assessment with clinical purposes. According to the results, all three studied task conditions for story eliciting are appropriate when choosing methods for narrative assessment. However, our results showed that the

difference between TD and LI children in terms of grammatical accuracy was most remarkable in self-generated narratives that were produced without previous model story; in fact, LI children's narratives of this type exhibited the highest occurrence of grammatical errors of the three types. In the other two narratives that were produced afterwards (narrative retelling and generation with previous model story), the frequencies of errors were significantly lower in the LI group. This result may seem surprising at first sight, indicating the effect of story modeling on grammatical accuracy for children with LI but not for those with TD. At least two reasons may be brought forth to explain this finding. First, the marginal decrease of grammatical errors in stories of children with TD may be related to a very low degree of these errors already in the narratives that were produced without previous model story (i.e., the first task). The high level of grammatical accuracy of the studied 6–7 year old children is in accordance with previous findings which describe that, in typical language development in Estonian, the basic grammatical structures are acquired by the age of four and the further development in terms of elaboration of grammatical forms, acquisition of grammatical irregularities, and usage of sentences in cohesive texts continues until the age of 8–10 years (see Karlep, 1998). Second, we suppose that the retelling task might be more familiar for the children. The task to tell a story was not sufficiently understandable in the first task condition, particularly for LI children, when they had to generate a narrative and no model story had been provided before storytelling. In the following task conditions, the model story made the task more understandable for the children. In retelling, they could also reuse some of the same linguistic devices that were used in the model story.

#### **4.5. Contribution of Narrative Production Skills to Reading Comprehension**

To study the contribution of the children's narrative production skills at the end of kindergarten to their reading comprehension in the first grade, we carried out path analyses separately for the three story eliciting methods (Study IV). Besides measures of narrative macrostructure and microstructure (SG score, INC, MLCU, and grammatical errors), variables of phonological awareness and vocabulary knowledge were included in the models as predictors of reading comprehension skills, as found in previous research in several languages (see Bast & Reitsma, 1998; de Jong & van der Leij, 2002; Dickinson & McCabe, 2001; Leppänen, Niemi, Aunola, & Nurmi, 2006; Lerkkanen, Rasku-Puttonen, Aunola, & Nurmi, 2004; Nation & Snowling, 2004; Parrila, Kirby, & McQuarrie, 2004). The SG score was chosen as a narrative measure referring to quantity of relevant information included in the narrative that has been found to be causally related to reading comprehension skills (Feagans & Appelbaum,

1986; Griffin et al., 2004; Hagtvet, 2003; Pankratz, Plante, Vance, & Insalaco, 2007). The INC was used because it accounts for several skills that have been found to contribute to reading comprehension: structuring a story (Cain, 2003; Cain & Oakhill, 1996; Chang, 2006; Griffin et al., 2004), representing adequately the content of the discourse (Feagans & Appelbaum, 1986; Griffin et al., 2004; Hagtvet, 2003; Pankratz, Plante, Vance, & Insalaco, 2007), and using evaluative elements (Griffin et al., 2004) and interclausal connectives (Cain, 2003). MLCU and grammatical errors were used as narrative microstructural measures reflecting mastery of storytelling at the sentence level.

Analyses revealed significant direct contributions of phonological awareness ( $\beta > .20$ ) and vocabulary knowledge ( $\beta > .28$ ) to reading comprehension as we expected. With regard to narrative measures, only the INC of self-generated narratives with previous model story was significantly, albeit weakly, correlated to the children's reading comprehension ( $r_s = .18$ ). However, after phonological awareness and vocabulary knowledge had been taken into account, no significant paths between narrative measures and reading comprehension were observed. The only narrative measure that had a borderline effect on reading comprehension was INC of retold narratives ( $\beta = .14, p = .073$ ).

This finding showed that, besides phonological awareness and vocabulary knowledge, the macrostructure of retold stories in terms of narrative complexity (scored as the INC), measured at the end of kindergarten, had an additional weak contribution to the children's reading comprehension one year later. The SG score as the other narrative macrostructure measure was not related to reading comprehension. This result was not in accordance to our expectation about the causal relationship between storytelling skills at the narrative macrostructure level and reading comprehension, as found in previous studies (e.g., Cain, 2003; Cain & Oakhill, 1996; Chang, 2006; Griffin et al., 2004; Feagans & Appelbaum, 1986; Griffin et al., 2004). In addition, the results indicated no significant relationships between the narrative production skills at the microstructure level (measured as MLCU and grammatical errors) and reading comprehension. This finding corroborates with the previous studies conducted with English-speaking children (Feagans & Appelbaum, 1986; Griffin et al., 2004).

To sum up, the findings indicate that besides vocabulary knowledge and phonological awareness that contribute strongly to reading comprehension, narrative retelling skills at the macrostructure level have additional effect on reading skills. The findings refer to the advantage of narrative retelling as a story eliciting method in language assessment when predicting children's reading development in its first stages. The stronger relationship between reading comprehension and story retelling, as compared to story generation, is explained by the retelling task that requires from children both comprehension and production of a narrative, thus involving more overlapping skills. The result is in accordance with Paris and Paris (2003), who support the use of story retelling tasks to identify children who are at risk for reading difficulties.

However, the influence of retold narrative macrostructure in this study was marginal and significantly weaker than that of vocabulary knowledge and phonological awareness. The marginal relationships between narrative production and reading comprehension skills may be caused by several factors. First, the marginal relationship may be due to the stimulus materials (i.e. picture sequences) for storytelling, providing plot content, story structure, and sequence for the storyteller. We suggest that the support provided by the picture sequences reduced the children's difficulties with storytelling, minimizing the differences in the narrative macrostructure of children with and without risk for poor reading comprehension. Second, the weak relationships may be due to the narrative macrostructure measures that we used (i.e., the SG score and the INC): it is possible that not all narrative elements involved in these measures differentiate children with different language competences in the studied age range, and thus, decrease the predictive effect on reading comprehension as well. Further study is needed to explain these results.

## 5. SUMMARY AND CONCLUSIONS

The main results and conclusions of the present dissertation are the following.

1. The majority of the studied 6–7 year old Estonian children with different levels of language competence were capable of producing structurally complete stories, including at least three main SG components – the initiating event, the attempt, and the consequence. The inclusion of information depicting the setting category and characters' internal states were much rarer in their narratives. The finding substantiates previous studies carried out with children from other European-based (mainly English-speaking) cultures, referring to the universal association of children's narrative skills and their development in similar cultural contexts in terms of storytelling values, traditions, and forms.
2. A strong correlation between the SG score and story length was found, referring to the significant relationship between narrative informativity and productivity. With other microstructural measures (mean length of C-units and grammatical errors), narrative macrostructure measures were related weakly. However, a specific association between storytelling skills at the macrostructural and microstructural levels occurred in group comparison: children whose stories were least informative produced significantly shorter C-units and made significantly more grammatical errors than children whose narratives' SG score was average or high. This relation between macrostructural and microstructural measures was not observed when comparing narratives of children whose stories included average and high quantities of story information units, neither for the mean length of C-units nor grammatical errors. The finding indicates that poor narrative ability is related to low levels of skills both at the macrostructural and microstructural levels, supporting the argument that measures of both levels should be taken into account in narrative assessment.
3. The children at different levels of language competence produced narratives that differed according to the macrostructure in terms of the presence of SG components (for the setting category), quantity of story information units (the SG score), as well as narrative complexity (the INC). The coding method of narrative macrostructure in terms of the presence of SG components was not meaningful for identifying children whose language development was impaired, at least when assessing self-generated narratives that were produced without previous model story. The SG score and the INC differentiated between children with different language competences, especially between children with LI and those with TD in retold stories and, to a smaller degree, in self-generated stories with previous model story. The interrater reliability for the SG score and the INC were high as well. The finding supports, first, the suitability of the SG score and the INC as clinical tools for narrative assessment in identifying children with LI ages 6–7 years. Second, the finding refers to the advantage of story retelling over story

generation tasks as well as story generation with previous model story over story generation without such model story in assessment of narrative skills in clinical practice.

4. The children with different language competences produced narratives that differed according to the microstructure in terms of the mean length of C-units (the MLCU) and frequency of grammatical errors: the higher the language competence was, the longer and more accurate C-units were produced during storytelling under the three different task conditions (narrative retelling and narrative generation with and without previous model story). Significant and large differences in the MLCU and grammatical errors between children with TD and LI support the use of these measures as clinical tools for narrative assessment when identifying children with LI ages 6–7 years. However, the moderate interrater reliability for grammatical errors (in Study III) refers to difficulties in the assessment of the grammatical accuracy of children’s oral narratives, which in turn, points to the need for modification of the scoring system of grammatical errors in the future. With regard to the MLCU and grammatical errors, all the studied story elicitation methods – narrative retelling and narrative generation with and without previous model story – are appropriate for narrative assessment for clinical purposes.
5. The analysis revealed that children with different language competences did not differ in productivity. Thus, children with language difficulties may generate stories as lengthy as their peers whose language competence is higher. Integrating the results of productivity and the SG score, the findings also demonstrate that, although the children with difficulties in language development generated as much quantity as their peers with average or high language competences, they said less qualitatively in terms of amount of relevant information. According to this finding, the use of productivity is not suggested as a clinical tool for narrative assessment at least when used alone.
6. In the processes of narrative retelling and narrative generation, different skills are involved: retelling tasks explore the child’s ability to recall a story formulated by someone else, narrative generation requires the child’s ability to independently formulate the story. To get a more comprehensive insight to a child’s storytelling abilities, both storytelling tasks are suggested for narrative assessment. Our findings support the use of picture-elicited narrative retelling and picture-elicited narrative generation with previous model story for narrative assessment when identifying children with LI in 6–7 years of age.
7. Besides phonological awareness and vocabulary knowledge, retold narrative’s macrostructure in terms of the INC, measured at the end of kindergarten, had additional weak contribution to the children’s reading comprehension at the end of the first grade of school. Neither the SG score as the other narrative macrostructure measure nor the MLCU and grammatical errors as the microstructure measures contributed to the children’s



reading comprehension. The finding supports the use of assessment measures of phonological awareness, vocabulary knowledge, and narrative production skills at the macrostructure level with the purpose to identify children who are at risk for reading difficulties in first stages of reading instruction in school. The finding also supports the advantage of narrative retelling task as story eliciting method for narrative assessment when predicting children's reading comprehension skills. However, due to the marginal effect of the retold stories' INC on reading comprehension, additional research is needed for recommendations about the clinical utility of story eliciting methods and narrative measures for language assessment when identifying children at risk for reading difficulties.

To sum up, the studies of the dissertation confirm the finding that children's narratives provide rich sources of information about language competence as found in previous research carried out in other cultures and languages. In the present dissertation, narratives of Estonian children at the kindergarten-school transition were examined. The information about a child's storytelling skills at the beginning of school might be useful for educational professionals – e.g., speech-language therapists and special education teachers – for screening but also for instructional purposes. The instrument of narrative production skills that was developed and tested for the present dissertation supports the use of story retelling and story generation with previous model story in narrative assessment when identifying children with LI and refers to the advantage of story retelling over story generation tasks when predicting children's reading difficulties. The findings indicate that measures of both macrostructural and microstructural levels of narrative differentiate between children with TD and with LI, emphasizing the importance of analyzing an individual's narrative performance also at these two structural levels. For identifying children who are at risk for reading comprehension difficulties, the findings indicate narrative macrostructure in terms of complexity as an additional predictor, besides phonological awareness and vocabulary knowledge. The results support the use of the INC as narrative macrostructure measure, both when identifying children with LI and those who are at risk for reading comprehension difficulties. At the narrative microstructural level, the mean length of C-units and grammatical errors are suggested as valuable measures for evaluating a child's language competence.

## **5.1. Limitations**

There are also some limitations that need to be addressed. First, we used only teacher evaluations of the children's language competence in Studies I and II. Although several researchers (e.g., Llosa, 2007; Meisels, Bickel, Nicholson, Xue, & Atkins-Burnett, 2001; Newman & McGregor, 2006) have found that

teacher judgments of children's skills could be trusted because those correlated well with external measures and discriminated accurately between students who have disabilities and those who do not, still teachers' evaluations of children's language competence might be highly subjective, and different teachers might base their evaluations on different behaviours that are included in language competence.

Second, the relatively small number of LI children in Study III may have influenced the power of detecting the statistical effect of language competence group on the studied narrative measures. In addition, although the children in this group had been diagnosed as having LI by speech-language therapists, they had three different clinical diagnoses, according to the *ICD-10 Classification of Mental and Behavioral Disorders* (World Health Organization, 1992), meeting the criteria for expressive language disorder, receptive language disorder, and mixed specific developmental disorders. The peculiarities of these various disorders might influence narrative production in other ways as well. Thus, caution should be exercised when making any generalizations from the results.

Third, the narratives were analyzed for macrostructure (in terms of the presence of SG components, the quantity of story information units, and complexity), and microstructure (in terms of productivity and grammaticality). Other measures, for example lexical diversity that has also been found to play significant role in narrative quality (see Hughes et al., 1997), were not examined in the study.

Fourth, all the studied narratives were elicited by picture sequences providing plot content, story structure, and sequence for the storyteller. Although the use of picture sequences is supported by several researchers for eliciting stories from children at the kindergarten and elementary school age (see Hughes et al., 1997; Schneider et al., 2006), other story eliciting methods with less external aid (e.g., a single picture or no visual stimuli) should be also used when collecting and analyzing narrative samples from the children. It is possible that narratives produced under the more stringent storytelling task conditions may reveal additional information about storytelling skills of children with different language competences.

## 5.2. Future Directions

Before starting to use the instrument of narrative assessment, more work is needed in several directions. First, future research should involve the examination of narratives produced by children in broader age range because developmental changes in storytelling skills, especially at the macrostructural level, appear to be very large between 5 and 12 years of age (Gillam & Pearson, 2004). Thus, investigation of narratives both by younger and older children than in the present studies is necessary. To date, although some studies have been carried out with younger (e.g., Mäesaar, 2010) as well as with older Estonian

children (e.g., Adamka, 2008; Pajuste, 2007), using the same stimulus materials and story eliciting methods as in the present work, the findings are not yet completely comparable due to the different scoring methods used in these studies. Thus, additional data collection as well as validation of the narrative measures and scoring methods of narrative samples is needed in the future.

Second, besides narratives elicited by picture sequences, other types of stories that are produced with less external support (e.g., a single picture or no visual prompt) should be examined. The macrostructure of narratives that are elicited by little external support might have stronger associations with children's language competence and their further reading comprehension skills than stories elicited by picture sequences, and this area should be explored in future research.

Third, the relationships between children's storytelling skills and reading comprehension should be examined longitudinally over several years. Through longitudinal study, the course of changes in narrative production skills as well as a causal relationship between children's storytelling skills and their further reading comprehension could be measured.

In conclusion, the findings of the dissertation provide valuable information about Estonian children's storytelling skills at the kindergarten-school transition. The next step would involve further research of children's narratives to get more information about the importance of these skills in the course of development as well as about the use of particular measures and story eliciting methods in narrative assessment. These additional findings contribute not only to the further development of an assessment instrument of child narrative production skills in Estonia but also to the wider field of discourse analysis.

## SUMMARY IN ESTONIAN

### Eesti laste pildipõhised narratiivid keelepädevuse näitajana üleminekul lasteaiast kooli

Laste narratiive (jutustusi) peetakse rikkalikuks keelematerjaliks keeleteaduslikes, psühholoogia- ning kõnepatoloogiaalastes uurimustes. Eri keeltes ja kultuurides läbi viidud uuringutes on leitud, et narratiivid eristavad hästi eri vanuses ja keeleliste võimetega lapsi ning jutustamisoskus koolieelses eas on seotud edasise akadeemilise edukusega, sealhulgas loetust arusaamisega. Siiski on uuringute tulemused sageli vastuolulised, mis võib olla tingitud keelte, uuritavate laste vanuse, uuringu protseduuri, hindamisvahendite ja uurimisobjektide erinevustest. Eesti laste narratiive on senini uuritud vähe ning esialgu puudub terviklik ülevaade laste jutustamisoskustest. Arvestades narratiiviloomete oskuste seost üldise kõnearengu taseme ning edasise õpieduga, on täpsem ülevaade kooliteed alustavate eesti laste jutustamisoskusest vajalik. Võimalikult varane riskilaste märkamine (kooli kontekstis 1. klassi alguses) on vajalik sobivate sekkumisstrateegiatega rakendamiseks õpiraskuste ennetamiseks ja/või ületamiseks.

Doktoritöö üldine eesmärk oli koostada kooliteed alustavate eesti laste jutustamisoskuste hindamise vahend logopeedidele ja eripedagoogidele ning testida selle sobivust alakõne (AK) ja lugemisraskuste riskiga laste eristamisel. Narratiivsete oskuste hindamise vahend on mõeldud kasutamiseks kombineerituna teiste hindamisvahenditega, olles abiks õpiraskuste riskiga laste identifitseerimisel. Lisaks riskilaste väljaselgitamisele võimaldaks narratiivi hindamisest tulenevale informatsioonile toetudes rakendada sobivat kõnearendustööd.

Väitekirja koosneb neljast artiklist ning kokkuvõtvast ülevaateartiklist, mis hõlmab uurimuse teoreetilist alust, andes ülevaate narratiivi struktuurist, jutustamisoskuse arengust eakohase kõnearengu (EK) ja AK korral ning narratiivi kui vahendi kasutamisest AK diagnostikas ja lugemisraskuste ennustamisel.

Jutustamisoskuse hindamise vahend koosnes kolmest viieosalisest pildiseeriast (kelgulugu, pallilugu, lumememmelugu) ja kahele pildiseeriale (pallilugu, lumememmelugu) vastavast tekstist. Pildiseeriatel kujutatud keskkond, tegelased ja tegevused olid eeldatavalt lastele tuttavad ning arusaadavad. Narratiivide usaldusväärse kodeerimise eesmärgil püüti pildiseeriad ja tekstid koostada keeleliselt ja sisuliselt sarnase raskusastme ning struktuuriga. Pildiseeriatel kujutatud ning tekstides väljendatud sündmustik vastas jutugrammatika mudelile (*Story Grammar Model*; Stein & Glenn, 1979), osutades mudeli sisukomponentidele: (1) taust, (2) käivitav sündmus, (3) sisemine vastus ehk tegelase reaktsioon käivitavale sündmusele, (4) sisemine plaan ehk tegelase plaan olukorra või probleemi lahendamiseks, (5) tegevus, (6) tagajärg, (7) tegelas(t)e reaktsioon. Testimine viidi läbi individuaalselt. Iga laps jutustas

kolm narratiivi, mis lindistati ning hiljem transkribeeriti. Esimese jutustuse aluseks oli kelguloo pildiseeria, teise ja kolmanda jutu aluseks olevate seeriade järjekorda vahetati iga järgneva lapse korral.

1. Vahendamata narratiiv eelneva mudelita. Testi läbiviija asetask lapse ette lauale kelguloo seeria esimese pildi ning palus ülejäänud pildid järjestada nii, et neist tekiks jutuke. Kui laps järjestask pildid valesti, pani testija need ise õigesse järjekorda. Lapsele anti piltide vaatamiseks aega ning paluti jutustada nende järgi üks lugu.
2. Vahendatud narratiiv (ümberjutustus). Testija asetask ükshaaval lapse ette pilte ning paralleelselt luges ette piltide kohta käiva jutukese (palli- või lumememmeloo). Peale jutu kuulamist paluti lapsel lugu ümber jutustada.
3. Vahendamata narratiiv eelneva mudeliga. Testimise protseduur oli sarnane esimesele narratiivile. Lapsed jutustasid palli- või lumememmeloo (vastavalt sellele, kumba nad teise narratiivina ei jutustanud). Narratiivi mudeliks oli vahendatud (teise) narratiivi aluseks olnud testija esitatud tekst.

Analüüs hõlmas narratiivide mikrostruktuuri, mis moodustub teksti väiksematest üksustest (sõnadest, lausungitest ja lausungitevahelistest seostest), ning makrostruktuuri ehk teksti üldist sisulist ülesehitust. Mikrostruktuuri tasandil analüüsiti jutustuste pikkust (sõnade hulka tekstis), lausungite (*communication unit*, vt Hughes, McGillivray, & Schmidek, 1997) keskmist pikkust sõnades ja grammatikavigade (s.o süntaksi- ja morfoloogiavigade) sagedust. Makrostruktuuri tasandi näitajateks oli jutugrammatika komponentide esinemine tekstis, infoüksuste hulk ja narratiivi komplekssus. Jutugrammatika komponentide esinemise ja infoüksuste hulga kodeerimine põhines Steini ja Glenni (1979) jutugrammatika mudelil. Narratiivi kompleksuse indeksi (Petersen, Gillam & Gillam, 2008 järgi) kodeerimise aluseks oli jutugrammatika mudel (Stein & Glenn, 1979) ning kõrgpunkti analüüs (*High point analysis*; vt Labov & Waletzky, 1967/1997; Peterson & McCabe, 1997; Hudson & Shapiro, 1991).

Doktoritöö täpsemad eesmärgid olid (1) kirjeldada kooliteed alustavate eesti laste pildipõhiseid suulisi narratiive makro- ja mikrostruktuuri tasandil; (2) selgitada, mil viisil jutustatud narratiivid (vahendamata jutustus ilma eelneva narratiivi mudelita, vahendatud jutustus, vahendamata jutustus eelneva narratiivi mudeliga) eristavad alakõnet eakohasest arengust kõige paremini; (3) selgitada, mil viisil jutustatud narratiivid (vahendamata jutustus ilma eelneva narratiivi mudelita, vahendatud jutustus, vahendamata jutustus eelneva narratiivi mudeliga) ennustavad kõige paremini loetu mõistmist esimese klassi lõpus. Töös tõstatati järgnevad uurimisküsimused.

1. Missugune on 6–7 aasta vanuste eesti laste vahendamata jutustuste makrostruktuur jutugrammatika komponentide poolest?
2. Missugused seosed esinevad narratiivide makro- ja mikrostruktuuri näitajate vahel?

3. Kuidas eristavad eri viisil jutustatud narratiivide makrostruktuuri näitajad (jutugrammatika komponentide esinemine, infoüksuste hulk, ja narratiivi kompleksuse indeks) erineva keelepädevusega laste rühmi?
4. Kuidas eristavad eri viisil jutustatud narratiivide mikrostruktuuri näitajad (jutustuste pikkus, lausungite keskmine maht, grammatikavigade sagedus) erineva keelepädevusega laste rühmi?
5. Kuidas seostuvad 6–7-aastaste laste eri viisil jutustatud narratiivide makro- ja mikrostruktuuri näitajad laste loetu mõistmisega esimese klassi lõpus?

**I uurimuses** analüüsiti 6–7-aastaste erineva keelepädevusega laste eelneva narratiivi mudelita koostatud vahendamata jutustuste makrostruktuuri (jutugrammatika komponentide esinemist ja infoüksuste hulka). Laste keelepädevuse kohta saadi informatsiooni lasteaia õpetajatelt, kes hindasid laste oskusi kolmepalli skaalal (kõrge, keskmine, madal). Tulemustest selgus, et enamiku laste narratiivid sisaldasid käivitavat sündmust, tegevust ja tagajärge. Taustakirjeldus esines umbes pooltes jutustustes ning otseseid viiteid tegelas(t)e sisemistele seisunditele ja reaktsioonide veelgi vähem. Keelepädevuse rühmade vahel esines erinevus vaid taustakirjelduse osas, mille esinemine oli oluliselt sagedasem kõrge keelepädevusega laste rühmas. Teiste jutugrammatika komponentide osas rühmadevahelisi erinevusi ei ilmnunud. Narratiivide infoüksuste hulk erines rühmade vahel, olles seda suurem, mida kõrgem oli laste keelepädevus õpetajate hinnangute alusel. Statistiliselt oluline erinevus esines kõrge ja madala keelepädevusega laste rühmade vahel.

**II uurimuses** kirjeldati 6–7 aasta vanuste laste eelneva narratiivi mudelita koostatud vahendamata jutustuste makrostruktuuri (jutugrammatika komponentide esinemist ja infoüksuste hulka) ja mikrostruktuuri (jutustuste pikkust, lausungite keskmist pikkust ja grammatikavigade sagedust) ning seoseid eri struktuuritasandite näitajate vahel. Sarnaselt I uurimusega pärines informatsioon laste keelepädevuse kohta lasteaia õpetajatelt, kes hindasid laste oskusi kõrgeks, keskmiseks või madalaks. Narratiivide makrostruktuuri osas kattusid tulemused I uurimusega. Jutustuste keskmine pikkus ei erinenud lasterühmade vahel, kuid lausungite keskmine pikkus ja grammatikavigade sagedus olid seotud keelepädevusega – mida kõrgem oli õpetajate hinnang laste keelepädevuse kohta, seda pikemaid ja grammatiliselt õigemaid lausungeid narratiivid sisaldasid. Lausungite keskmise pikkuse osas ilmnis statistiliselt oluline erinevus kõrge ja madala keelepädevuse rühma vahel, grammatikavigade sageduse osas kõikide rühmade vahel. Narratiivi kahe struktuuritasandi näitajate vahelised seosed olid enamjaolt nõrgad, v.a kõrge positiivne korrelatsioon infoüksuste hulga ja jutustuste pikkuse vahel. Dispersioonanalüüs näitas, et laste rühmas, kus narratiivid sisaldasid vähe olulist informatsiooni, olid jutustused oluliselt madalamal tasemel ka lausungite keskmise pikkuse ja grammatikavigade sageduse osas, võrreldes nende laste rühmadega, kus olulise informatsiooni hulk narratiivis oli keskmine või kõrge.

**III uurimuses** võrreldi 6–7 aasta vanuste EK ja AK laste eri viisil jutustatud narratiivide makrostruktuuri (infoüksuste hulka ja narratiivi kompleksust) ning mikrostruktuuri (lausungite keskmist pikkust ja grammatikavigade sagedust). Tulemustest selgus, et makrostruktuuri näitajate poolst olid AK laste vahendatud jutustused ja eelnevalt mudeldatud vahendamata jutustused (vähemal määral) oluliselt madalamal tasemel kui EK laste vastavad narratiivid. Vahendamata jutustustes, mis olid koostatud eelneva narratiivi mudelita, rühmadevahelisi erinevusi ei olnud. Mikrostruktuuri näitajad erinesid statistiliselt oluliselt kõigis kolmes eri viisil jutustatud narratiivis AK ja EK laste vahel.

**IV uurimuses** kirjeldati seoseid 6–7 aasta vanuste laste eri viisil jutustatud narratiivide makrostruktuuri tasandi näitajate (infoüksuste hulga ja narratiivi kompleksuse indeksi) ning mikrostruktuuri tasandi näitajate (lausungite keskmise pikkuse ja grammatikavigade sageduse) vahel ning nende seost (lisaks fonoloogilistele ja verbaalsetele oskustele) laste loetu mõistmisega üks aasta hiljem, s.o esimese klassi lõpus. Leiti, et narratiivi eri struktuuritasandite näitajad olid omavahel nõrgalt seotud. Esimese klassi loetu mõistmisega seostusid tugevalt fonoloogilised oskused ja sõnade tundmine. Narratiivi näitajatest avaldas otsest nõrka mõju vaid vahendatud jutustuste narratiivi kompleksuse indeks (statistiliselt piiripealsel määral), teised narratiivi näitajad loetu mõistmisega otseselt seotud ei olnud.

Dissertatsiooni peamised tulemused ja järeldused on järgmised.

1. Enamik uuritud 6–7 aasta vanuseid eri keelepädevusega eesti lapsi koostas narratiive, mis sisaldasid vähemalt kolme struktuurilt kõige olulisemat jutugrammatika komponenti – käivitavat sündmust, tegevust ning tagajärge. Taustakirjeldust ja tegelas(t)e sisemisi seisundeid ja reaktsioone väljendasid lapsed oma eelnevalt mudeldamata vahendamata narratiivides oluliselt harvem. Tulemus on sarnane teistes euroopaliku kultuuriga (peamiselt ingliskeelsetes) maades läbi viidud uuringute tulemustega, viidates laste jutustamisoskuse ja arengu universaalsele seosele sarnastes kultuurikontekstides.
2. Narratiivi infoüksuste hulga ja sõnade hulga vaheline tugev korrelatsioon viitab narratiivi informatiivsuse ja mahu olulisele seosele. Narratiivi teiste mikrostruktuuri näitajate (lausungite keskmise pikkuse ja grammatikavigade sageduse) ning makrostruktuuri näitajate vahel olid seosed nõrgad. Rühmade võrdluses ilmnes siiski märkimisväärne seos: nende laste narratiivid, mis sisaldasid vähe olulist informatsiooni (keskmisest oluliselt madalam infoüksuste hulk), koosnesid ka oluliselt lühematest ja grammatiliselt ebakorreksematest lausungitest, võrreldes keskmist ja kõrget infoüksuste hulka sisaldavate narratiividega. Kirjeldatud seost narratiivi makro- ja mikrostruktuuri näitajate vahel ei ilmnenu keskmiist ja kõrget infoüksuste hulka sisaldavate narratiivide omavahelises võrdluses. Tulemus näitab, et nõrk

- jutustamisoskus on seotud nii makro- kui mikrostruktuuri tasandi tekstiloome oskustega, toetades ühtlasi seisukohta, et narratiivide hindamisel kliinilises praktikas tuleb analüüsida mõlema struktuuritasandi oskusi.
3. Eri keelepädevuse tasemega laste narratiivid erinesid makrostruktuurilt nii jutugrammatika komponentide esinemise (taustakirjelduse osas), infoüksuste hulga kui ka narratiivi kompleksuse indeksi osas. Töö tulemused kinnitavad infoüksuste hulga ja narratiivi kompleksuse indeksi sobivust jutustuste makrostruktuuri näitajatenä AK diagnostikas 6–7 aasta vanuses. Narratiivide hindamiseks makrostruktuuri tasandil on sobivaim jutustamisviis vahendatud narratiiv, millele järgneb eelnevalt mudeldatud vahendamata narratiiv.
  4. Eri keelepädevuse tasemega laste narratiivid erinesid mikrostruktuurilt lausungite keskmise pikkuse ja grammatikavigade sageduse poolest: mida kõrgem oli keeleline pädevus, seda pikemaid ja vähem grammatilisi vigu sisaldavaid lausungeid lapsed oma jutustustes koostasid. Lasterühmade vahelised erinevused ilmnisid kõigis kolmes eri viisil koostatud narratiivis – vahendamata jutustustes eelneva narratiivi mudelita, vahendatud jutustustest ning vahendamata jutustustes eelneva narratiivi mudeliga. Statistiliselt olulised ja suured erinevused lausungite keskmises pikkuses ja grammatikavigade sageduses EK ja AK laste narratiivide vahel toetavad nende näitajate sobivust AK diagnostikas 6–7 aasta vanuses. Mõõdukas hindajate vaheline reliaablus grammatikavigade osas (III uurimuses) viitab siiski suuliste narratiivide grammatilise õigsuse hindamise problemaatilisusele, osutades seega vajadusele grammatikavigade skoorimissüsteem edasise töö käigus ümber vaadata. Lausungite keskmise pikkuse ja grammatikavigade sageduse hindamisel AK diagnostikas on sobivaks hindamisvahendiks kõigil kolmel viisil jutustatud narratiivid.
  5. Uurimus näitas, et laste jutustuste pikkus ja keelepädevuse tase ei ole omavahel seotud: lapsed, kelle keelelisi oskusi hindasid õpetajad madalaks, suutsid koostada sama mahukaid narratiive kui nende keskmise ja kõrge keelepädevuse tasemega eakaaslased. Integreerides jutustuste pikkuse ja infoüksuste hulga tulemusi, võib väita, et kuigi nõrkade keeleliste oskustega laste narratiivid olid mahult sarnased oma tavaarenguga eakaaslaste jutustustega, olid nad sisult vähem kvaliteetsed, sisaldasid vähem mõistmise seisukohalt olulist informatsiooni. Kirjeldatud tulemuste alusel ei ole soovitatav kasutada jutustuste mahtu näitajana narratiivi hindamisel kliinilises praktikas, vähemalt isoleerituna teistest narratiivi näitajatest.
  6. Vahendatud ja vahendamata tekstiloome protsessid eeldavad mõneti erinevate oskuste rakendamist. Vahendatud tekstiloome eeldab oskust kellegi teise poolt formuleeritud teksti mõtestada, meeles hoida ning seda ümber jutustada. Vahendamata tekstiloomel tuleb aga kõnelejal väljendada oma mõtet ning see iseseivalt sõnastada. Saamaks terviklikku ülevaadet lapse jutustamisoskustest, tuleks narratiivi hindamisel kasutada mõlemaid jutustamisviise. Käesolev uurimus kinnitab pildipõhiste vahendatud jutus-



tuste ning eelnevalt mudeldatud vahendamata jutustuste sobivust hindamisvahenditena AK diagnoosimisel 6–7 aasta vanuses.

7. Lisaks fonoloogilistele ja verbaalsetele oskustele seostus vahendatud jutustuste makrostruktuur (väljendatud narratiivi komplekssuse indeksina) nõrgalt laste loetu mõistmisega esimese klassi lõpus. Teised narratiivi näitajad lugemisoskusega seotud ei olnud. Töö tulemused kinnitavad fonoloogiliste ja verbaalsete oskuste hindamise vajalikkust laste lugemisoskuse prognoosimisel lugemisoskuse arengu esimestel etappidel. Samuti toetavad tulemused narratiivi makrostruktuuri näitajate ning vahendatud jutustuse kasutamist jutustamisviisina laste keeleliste oskuste hindamisel lugemisoskuse ennustamise eesmärgil. Nõrgad seosed vahendatud jutustuse makrostruktuuri ja loetu mõistmise vahel viitavad siiski edasiste uuringute vajadusele narratiivi hindamismeetodite osas.

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# APPENDIXES

## APPENDIX A. Picture sequences for story elicitation

### 1. Sledding



### 2. Ball Game



### 3. Snowman



**APPENDIX B.** The index of the narrative complexity scoring system (adapted from Petersen, Gillam, & Gillam, 2008)

<b>Narrative Element</b>	<b>0 Points</b>	<b>1 Point</b>	<b>2 Points</b>	<b>3 Points</b>
Characters	<i>No main character is included, or only ambiguous pronouns are used.</i>	<i>Includes at least one main character with nonspecific labels only.</i>	<i>Includes one main character with a specific name for the character.</i>	<i>Includes more than one main character with specific names.</i>
Setting*	<i>No reference to specific or general time, place or activity.</i>	<i>Includes one reference to time, place or activity.</i>	<i>Includes two or more references to time, place or activity.</i>	
Initiating Event	<i>An event or problem likely to elicit a response from the character is not stated.</i>	<i>Includes at least one stated event or problem that is likely to elicit a response from the character, but there is no response directly related to that event.</i>	<i>Includes at least one stated event or problem that elicits a response from the character(s).</i>	<i>Two or more distinct stated events or problems that elicit a response from the character(s).</i>
Internal Response	<i>No overt statement about a character's psychological state.</i>	<i>One overt statement about a character's psychological state not causally related to an event or problem.</i>	<i>One or more overt statements about a character's psychological state causally related to an event or problem.</i>	
Internal Plan	<i>No overt statement is provided about the character's plan to act on or solve the event or problem.</i>	<i>One overt statement about how the character might solve the complication or problem.</i>	<i>Two overt statements about how the character might act on or solve the event(s) or problem(s).</i>	<i>Three or more overt statements about how the character might act on or solve the event(s) or problem(s).</i>
Action/Attempt	<i>No actions are taken by the main character(s).</i>	<i>Actions by main character are not directly related to the initiating event.</i>	<i>Attempts by main character are directly related to the initiating event.</i>	
Complication	<i>No complications.</i>	<i>One complication that prohibits a plan or action from being accomplished.</i>	<i>Two distinct complications that prohibit plans or actions from being accomplished.</i>	
Consequence	<i>No consequence to the attempt is explicitly stated.</i>	<i>One consequence.</i>	<i>Two consequences.</i>	<i>Three or more consequences.</i>

*(continues)*

**APPENDIX B.** The index of the narrative complexity scoring system (*Continued*)

<b>Narrative Element</b>	<b>0 Points</b>	<b>1 Point</b>	<b>2 Points</b>	<b>3 Points</b>
Formulaic markers (Any standard utterance to mark the beginning or ending of a narrative)	<i>No</i> formulaic markers.	<i>One</i> formulaic marker.	<i>Two or more</i> formulaic markers.	
Temporal markers*	<i>No</i> temporal markers.	<i>One</i> temporal marker or marker <i>then</i> usage repetively.	<i>Two or more</i> temporal markers.	
Markers for causal relations	<i>No</i> markers for causal relations.	<i>One</i> marker for causal relation.	<i>Two or more</i> markers for causal relations.	
Knowledge of dialogue	<i>No</i> dialogue.	<i>One</i> character makes a comment or statement.	<i>Two or more</i> characters engage in conversation.	
Narrator evaluations	<i>No</i> narrator evaluations.	<i>One</i> narrator evaluation.	<i>Two or more</i> narrator evaluations.	

*Note.* \* - scoring system is modified by Piret Soodla.

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