

**TEMPORALITY IN THE NARRATIVES OF CHILDREN WITH SPECIFIC  
LANGUAGE IMPAIRMENT AND TYPICALLY DEVELOPING CHILDREN**

by

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## Abstract

*Purpose:* This study examined the use of linguistic devices to express time— *temporality* –in the narrative productions of a group of children with Specific Language Impairment (SLI) compared to typically developing (TD) peers.

*Method:* Participants formed two age-matched groups of 5- to 8-year-old children (SLI,  $n = 28$ ; TD,  $n = 28$ ;  $M$  age = 6 years;10 months). Each child produced two narratives from multi-episode wordless picture books that were transcribed and coded for temporal grammatical and lexical markers: past or present tense (e.g., *jumps, jumped*), simple or progressive aspect (*built, was building*), aspectual verbs (e.g., *start, finish*), connectors (e.g., *and then, before, while*), and other temporal expressions (e.g., *later, again, suddenly, quite a while*).

*Results:* Children with SLI showed differences in expressing temporality using grammatical markers compared to TD peers. The children with SLI had more tense omissions in obligatory tense marking contexts (e.g., *The frog \*jump*) and more frequent unmotivated tense shifting. As a result, fewer children with SLI used a consistent verb tense throughout their narratives, i.e., an *anchor tense*. Nonetheless, both groups used the past tense more often than the present tense, and children who had an anchor tense tended to tell their stories in the past. Both groups showed a preference for using simple over progressive aspect. Present progressive forms, which are generally associated with a picture-description mode, were in the minority for both groups. The children with SLI did, however, produce fewer complex progressive forms (e.g., *he tries finding*) compared to TD peers. Regarding lexical markers of temporality, the groups generally performed similarly in terms of the frequency of use of aspectual verbs, sequential or simultaneous temporal connectors, and other temporal expressions.

*Conclusion:* This study highlights that 5- to 8 year-old children with SLI showed a relative strength in their use of lexical compared to grammatical markers of temporality in narratives they produced from wordless picture books. This study adds to the limited research on temporality in narratives of children with or without SLI. It has implications for interventionists and educators who use narrative production for assessment and intervention.

## **Preface**

The current project used archive data from two projects that were approved by the UBC Behavioural Research Ethics Board [certificates #H09-00350 and #H11-00806]. Use of de-identified data for future projects examining language development and narrative discourse abilities in children was indicated in the consent forms and ethics applications. The original projects were designed and completed as master's theses by Cristy (McNiven) Whitely and Jillian Frick. Additional participants were recruited to both projects to increase the sample size, and various research assistants contributed to data collection, transcription of language samples, and other data entry, most notably Cristy (McNiven) Whitely and Heather Morris. The current project is closely linked to a research project completed as a final graduating requirement by Rebecca Kowalenko. In particular, the detailed coding scheme that was applied here was adapted from the Kowalenko study, and the data from some of the typically-developing children overlap across the studies. For the current project, I collected some of the data and transcribed some of the narratives. I was responsible for developing the research questions, analysing the data, and writing the thesis, with supervision from Paola Colozzo.

# Table of Contents

<b>Abstract.....</b>	<b>ii</b>
<b>Preface.....</b>	<b>iv</b>
<b>Table of Contents .....</b>	<b>v</b>
<b>List of Tables .....</b>	<b>viii</b>
<b>List of Abbreviations .....</b>	<b>ix</b>
<b>Acknowledgements .....</b>	<b>x</b>
<b>Dedication .....</b>	<b>xi</b>
<b>Chapter 1: Introduction .....</b>	<b>1</b>
1.1    Motivation for the current study .....	1
1.2    The clinical relevance of narratives .....	1
1.3    Grammatical and lexical markers of temporality.....	4
1.3.1    Tense .....	5
1.3.2    Aspect .....	7
1.3.3    Temporal lexical items.....	8
1.4    Temporality in narratives .....	9
1.5    Typical development of temporality in narratives .....	12
1.6    Narrative development in children with SLI .....	21
1.7    Research questions.....	26
<b>Chapter 2: Method.....</b>	<b>29</b>
2.1    Participants.....	29
2.1.1    Matching .....	30

2.2	Materials and procedures .....	31
2.2.1	Tests for inclusion criteria of children with SLI.....	31
2.2.2	Narrative tasks .....	32
2.2.3	Transcription and coding of the narratives .....	34
2.2.3.1	Transcription.....	34
2.2.3.2	Grammatical markers.....	34
2.2.3.3	Lexical markers.....	36
2.2.3.4	Repetition of VPs.....	38
2.2.3.5	Exclusion of dialogue .....	38
2.3	Analyses.....	38
<b>Chapter 3: Results.....</b>		<b>39</b>
3.1	Story characteristics .....	39
3.2	Tense.....	41
3.2.1	Tense distribution.....	41
3.2.2	Anchor tense .....	43
3.2.3	Tense shifts .....	45
3.3	Aspect .....	48
3.3.1	Non-canonical progressives .....	49
3.4	Temporal lexical markers .....	51
3.4.1	Aspectual verbs.....	52
3.4.2	Temporal connectors.....	53
3.4.3	Other temporal expressions.....	54
3.4.4	More advanced temporal lexical items .....	54

3.5	Repetition.....	54
<b>Chapter 4: Discussion.....</b>		<b>56</b>
4.1	Grammatical results .....	56
4.1.1	Tense.....	57
4.1.2	Aspect .....	61
4.1.3	Summary of grammatical findings.....	63
4.2	Lexical results .....	64
4.2.1	Temporal connectors.....	64
4.2.2	Other lexical features .....	67
4.2.3	Summary of lexical results.....	69
4.3	Practice/story effects.....	70
<b>Chapter 5: Conclusion.....</b>		<b>72</b>
5.1	Clinical relevance.....	74
5.2	Limitations .....	76
5.3	Future directions .....	77
<b>References.....</b>		<b>78</b>
<b>Appendices.....</b>		<b>86</b>
Appendix A: Participant standard scores on the TOLD-P-4 subtests.....		86
Appendix B: Detailed coding decisions for tense and aspect.....		87
.1	Tense.....	87
.2	Aspect .....	89
.3	Shifts in tense in the main narrative.....	90
Appendix C: Temporal lexical items .....		91

## List of Tables

Table 2.1 Participant demographic data.....	30
Table 3.1 Story characteristics.....	40
Table 3.2 Mean numbers of VPs (and SDs) produced by tense category.....	42
Table 3.3 Numbers (and percentages) of narratives with and without an anchor tense .....	44
Table 3.4 Numbers (and percentages) of children who told their narratives with or without a consistent anchor tense .....	45
Table 3.5 Mean proportions (and SDs) for types of progressive VPs .....	50
Table 3.6 Mean rates (and SDs) of temporal lexical markers per VP, by type .....	52



## List of Abbreviations

AF: *April Fools* (Krahn, 1974)

FOHO: *Frog On His Own* (Mayer, 1973)

SLI: Specific Language Impairment

TD: Typically developing

VP: Verb phrase

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This research is the result of a collaboration of many people, both those who were named herein and those who were not; I thank each and every one of you, and I trust that you know who you are.

## **Dedication**

To all the yoga teachers who helped me stretch and bend my body, heart and mind.

Especially to Veronica Vukusic, who helped me take my fences down, and to Jazz Braden, who taught “if you fall on your face, you’re still moving forwards.”

Intellectually and physically, it accomplishes something to flip upside-down and back again.

What exactly, I’m not sure, but perhaps its magic lies in its mystery.

## Chapter 1: Introduction

This study adds to the knowledge base of how children with Specific Language Impairment (SLI), aged 5 to 8 years, use linguistic devices to express temporal meanings when producing narratives, as compared to typically developing (TD) peers.

### 1.1 Motivation for the current study

Specific Language Impairment is a developmental disorder that negatively affects a child's language abilities, but that is not attributable to another developmental, genetic, or medical condition (Leonard, 2014). Although it is not well-known, it is not a rare disorder, with estimated prevalence rates of 7% (Tomblin et al., 1997), and is typically identifiable by approximately 3 years of age (Leonard, 2014; Tager-Flusberg & Cooper, 1999). Children with SLI show persistent difficulties with narrative production, both in terms of content and form (see Colozzo, Gillam, Wood, Schnell, & Johnston, 2011, for a review). Although much prior research has focused on the narrative abilities of children with SLI, one feature that has received little attention is the use of linguistic devices to express time—or *temporality*—yet children with SLI who speak English have particular difficulty with tense morphology (Leonard, 2014). Moreover, temporality is critical to creating a coherent and interesting text. The purpose of the current project is to document the grammatical and lexical markers of temporality in the narratives of children with SLI aged 5 to 8 years compared to a group of age-matched TD peers. The following sections summarize the research that provides a backdrop for the current study.

### 1.2 The clinical relevance of narratives

Producing narratives is a complex task for TD children and children with SLI alike. Producing a cohesive and coherent narrative requires many types of knowledge to be used together at a quick pace, including world knowledge (general knowledge acquired from

experiences), genre-specific knowledge (e.g., knowing how to open or close a story), structural knowledge (e.g., producing a narrative with a discernible beginning, middle, and end, and how to link events that form a plot), and linguistic knowledge (e.g., vocabulary and a variety of syntactic forms) (Colozzo et al., 2011). Narrative production also requires narrators to use social knowledge by considering the listener's knowledge and interest, monitoring listeners' reactions, and adapting to these reactions (Paul & Norbury, 2012). All of these types of knowledge, combined with the inherent speed of language production, contribute to the high cognitive demands of narratives. Reasonably, given the complex demands that producing narratives presents, children with SLI and other diagnoses (e.g., Autism Spectrum Disorder) often need support to develop this ability to their full potential (Colozzo, Morris, & Miranda, 2015).

Narratives can serve as a naturalistic context for assessment of children with suspected SLI, as most standardized tests impose structure and predictability onto tasks, and generally focus on the word or sentence levels. Hence, it can be easier for many children with communication needs to perform better in the more contrived contexts of assessment than the more natural communicative interactions they encounter day-to-day (Guo & Schneider, 2016; Eisenberg & Guo, 2016). For some children, areas of deficit may only emerge when they are presented with more demanding tasks, such as producing narratives. Assessing children's narrative abilities can help speech-language pathologists (SLPs) gain an idea of children's language abilities in naturalistic and cognitively demanding contexts (Colozzo, et al., 2011), which can be helpful in establishing intervention goals.

Narratives are frequently used in every day communication, both in social and academic contexts. For example, children are often asked to recount their day to parents (i.e., personal narratives), and they often engage in games that involve creating characters by personifying toys

(i.e., fictional narratives). Children are also exposed to narratives in school settings during story time and as a means to present academic content such as history or social studies. Between the ages of 5 and 8 years, children are expected to understand and produce increasingly complex written and oral language at school. Over the span of a few years, they are expected to progress from learning to read, to following complex instructions, producing written works and oral presentations, and interpreting written mathematical problems. By the end of this age bracket, children are expected to glean knowledge from texts, answer questions regarding texts, and apply knowledge from such texts to real-life contexts in order to meet curricular expectations. These skills require the ability to effectively use narratives: children are expected to interpret narratives they hear and read to acquire new knowledge, and to use narratives effectively in their own spoken and written language to demonstrate their learning. It is hence not surprising that narrative ability is a long-term predictor of language and literacy outcomes (Botting, Faragher, Simkin, Knox, & Conti-Ramsden, 2001; Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998). There are thus many reasons to support children's development of narrative abilities, given that children who are unable to tell well-constructed narratives could suffer many repercussions in the domains of safety, social development, and/or academic success (Paul & Norbury, 2012).

Although much prior research has considered narrative development in children with typical language and the narrative abilities of children with SLI, temporality has rarely been the focus of inquiry. Children with SLI have particular difficulty with marking morphology on verbs (Leonard, 2014), which is crucial to the English tense system and is one way to express temporality. Few studies, however, have investigated how children with SLI use tense or other markers (e.g., aspectual markers and temporal lexical items) in their narratives. Expressing

temporality is necessary to advance narratives, and to create coherent and interesting (oral or written) texts. The ways in which children with SLI express temporal meanings when producing narratives may guide clinicians with respect to helping them enhance their narrative development and make the transition to other coherent texts.

### **1.3 Grammatical and lexical markers of temporality**

A narrative is coherent if it is interpretable to the listener through bottom-up processing, e.g., by hearing and interpreting what the storyteller says, and through top-down processing, e.g., by integrating the story into one's own predictions, expectations, and previous experiences (Bamberg, 1987, p. 14). For example, if someone tells a story about jumping off a dock into a lake, the listener will interpret the lexical choices and grammatical organization of the speaker's language, as well as their tone of voice, and any gestures they might use to supplement their story. While listening to the story and interpreting these cues, the listener must consult her own knowledge about the world, and might remember a time when she jumped off a dock, and form expectations about what might happen in the current story based on her own experience.

In order for narratives to be coherent, they must be cohesive; this means that the intended meaning must be divided into smaller units, expressed through language, and those units must be combined in a rule-governed way (Bamberg, 1987, p. 14). Language is composed of many types of units (e.g., phonological, morphological), but *situations*, which represent the content of clauses, are the most relevant units for analysis with respect to temporality (Comrie, 1976). Situations include actions, states, events, and processes. Following Declerck (2006), actions are performed by an agent (e.g., *walk, read, drink*), states simply hold (e.g., copula *be, believe*), events simply happen (e.g., *burst, happen, fall*), and processes develop (e.g., *change, get dark*). Situations have a temporal structure in and of themselves, which are expressed by tense and

aspect (see below). Situations also contribute to narrative temporality when they are linked and thereby create a narrative timeline. In the English language, temporal meanings can be expressed by marking tense and aspect on verbs and by using lexical aspect markers and temporal lexical items (e.g., adverbs and conjunctions). These various means of expressing temporal meanings will be reviewed in the next section.

### 1.3.1 Tense

Tense is deictic, as its meaning is dependent on the context in which it occurs (Smith, 2009; Comrie, 1976). Tense markings on verbs orient the situations that are described around speech time (Huddleston & Pullum, 2005; Crystal, 2002; Smith, 2009; Sarkar, 1998). When a verb is marked for tense, the morphology refers to a past or non-past temporal domain relative to the moment of speaking (i.e., speech time) or another time (i.e., event time or reference time; see below) (Declerck, 2006). This typically occurs at least once per utterance, although not all verb forms are marked for tense.

Verbs can be divided into two types: lexical and auxiliary (Huddleston & Pullum, 2005). Most verbs in English are lexical verbs, meaning that they communicate a semantic meaning separate from their grammatical function (e.g., *walk*, *carry*, *see*). Auxiliary verbs make up a small number of verbs in English, and they are used to mark tense, aspect, mood, or voice (Huddleston & Pullum, 2005). Auxiliary verbs can be divided into two categories: primary auxiliaries and modal auxiliaries. Primary auxiliaries (e.g., *be*, *have*, *do*) can be used as either lexical verbs (e.g., *She is happy*; *She has money*) or auxiliary verbs (e.g., *She is swimming*; *She has seen that show*). Modal auxiliaries are a closed class of verbs that are unmarked for person, but are marked for tense, and can be considered to distribute into non-past forms (e.g., *must*, *can*,



*will, shall, may*) and past (i.e., preterite) forms (e.g., *could, would, should, might*) (Huddleston & Pullum, 2005).

Most researchers agree that English has two primary tense groups that can be expressed morphologically and marked inflectionally on the lexical verb or the *be* auxiliary: present and past, e.g., present: *he goes/is going to school*; past: *he went/was going to school* (Declerck, 2006; Huddleston & Pullum, 2005). Some researchers consider a third tense group, the perfect tenses, which express past time and are marked on the *have* auxiliary, e.g., *he has gone/has been going to school*; *he had gone/had been going to school* (Declerck, 2006; Huddleston & Pullum, 2005). The perfect tenses are considered to be compound tenses: past tenses with primary tense marking (present or past) on the *have* auxiliary (Huddleston & Pullum, 2005). Both present perfect and past perfect tenses express past time, as seen in the examples above; yet, present perfect usually co-occurs with present tenses, and past perfect with past tenses (Bamberg, 1987). With the present perfect “the past time situation is conceived of as having some kind of current relevance” (Huddleston & Pullum, 2005, p. 49; e.g., *The cat’s trying to catch the frog | The cat has got it*). The past perfect denotes that one situation (the reference time) is anterior to another that is expressed in a different clause (the event time), where both are in the past (e.g., *the boy told his mother what had happened*) (Timberlake, 2007). It is noteworthy that perfect forms are rare in North American English speakers of all ages, including adults (Hickmann, 2003).

There is less consensus regarding the existence of a future tense in English (Declerck, 2006; Huddleston & Pullum, 2005; Smith, 2009; Crystal, 2002). Futurity can of course be expressed, but there is not a one-to-one correspondence between linguistic forms and future time. The modals *will* or *would* and the semi-modal *be + going to*, for instance, are sometimes used to express futurity. Furthermore, verbs in the present tense can be paired with temporal

connectors or subordinate clauses and relate to future time, e.g., *My sister arrives tomorrow; I'll dry my clothes after I wash them* (Huddleston & Pullum, 2005; Sarkar, 1998). The modal *will* can also be used to express relations in the present and past tense (e.g., present: *I'll dry my clothes now*; past: *She will have finished the book by now*) (Sarkar, 1998).

Some verb forms are not marked for tense and provide the listener with very limited temporal information. These include verbs in imperative mood (e.g., *Take the garbage to the curb*) and subjunctive mood (e.g., *The woman wished she were not broke*), infinitival forms (e.g., *He likes to run*), and nonfinite participles (e.g., *She tried swimming*) (Declerck, 2006; Huddleston & Pullum, 2005).

### **1.3.2 Aspect**

Grammatical aspect refers to how a situation is internally temporally structured, i.e., its temporal contour (Declerck, 2006; Comrie, 1976). Across languages, grammatical aspect can be divided into perfective or imperfective, although English has a limited grammatical aspect system. When using *perfective aspect*, the speaker refers to a whole situation, as opposed to a situation that is divided into parts. This does not necessarily mean that the event has been completed, but rather that the beginning, middle, or end are not referred to as separated parts. Although there is no grammatical perfective aspect in English, simple (i.e., non-progressive) forms are generally considered to fall under perfective aspect (e.g., *she eats soup; she ate soup*). When using *imperfective aspect*, the speaker refers to a situation as it is in progress, and can focus on either the duration, the beginning, or the end of a situation. In English, only progressive aspect is marked grammatically (e.g., *She is eating soup*); the participle *-ing* indicates a situation as ongoing (or durative or continuative). The three tense groups in English each consist of simple (non-progressive) and progressive forms that differ with regard to aspect: present, e.g., *he walks*

vs. *he is walking*; past, *he walked* vs. *he was walking*; present perfect: *he has walked* vs. *he has been walking*; past perfect: *he had walked* vs. *he had been walking*. Two other subtypes of imperfective aspect can be marked lexically in English with aspectual verbs. Ingressive aspect is marked using verbs such as *start* and *begin* (e.g., *she started eating*). Egressive aspect is marked using verbs such as *finish* and *stop* (e.g., *she finished eating*).

### 1.3.3 Temporal lexical items

Temporal lexical markers include verbs that have an aspectual quality (i.e., aspectual verbs, such as *stop*, *finish*, *keep on*) and words or phrases from various lexical categories, such as conjunctions and adverbs.

Aspectual verbs can be used to add a layer of aspectual information beyond what is expressed through grammatical tense/aspect. Meanings expressed with aspectual verbs include ingressive, which indicates the beginning of a situation (e.g., *he started washing the dishes*; *he began the project*); egressive, which indicates that a situation is complete (e.g., *she finished assembling the couch*) or terminated (e.g., *she stopped assembling the couch*); and lative, which indicates a changing location in order to do something (*he went to find the frog*) (Berman & Slobin, 1994; Declerck, 2006). Progressive aspect may also be expressed through a combination of grammatical means and aspectual verbs, e.g., *he kept on building it* (Declerck, 2006).

Temporal lexical items can be used to express various temporal meanings, as well as relationships between situations; these lexical items cannot grammatically be used instead of tense or aspect markings on verbs, but “their meanings often reinforce the temporal notions of tense or aspect” (Krantz & Leonard, 2007, p. 138), or indicate temporal relationships between clauses (Bamberg, 1987). Temporal lexical items can express a variety of functions, such as whether a situation occurred once (i.e., a non-habitual, such as *Erin washed her car today*) or

many times (i.e., a habitual, such as *Erin washed her car every Friday*) (Smith, 2009). They can also fall into many categories, such as conjunctions (e.g., *while, when*), prepositions (e.g., *after, before*), adverbs (e.g., *yesterday, suddenly*), and phrases (e.g., *in the end, at the same time*).

Lexical items with a temporal quality are associated with syntactic patterns that vary in grammatical complexity. For example, temporal prepositions and conjunctions sometimes result in a complex sentence where the main clause is linked to a subordinate clause, e.g., *Go get your snack after washing your hands; When you are eating your snack, be careful not to spill*.

Compound sentences are often created when using temporal conjunctions and some temporal phrases (e.g., *The trampoline broke and the boy fell down at the same time*). Finally, some words with temporal and aspectual qualities can be used in simple sentences (e.g., *I ran around the block again; It started raining suddenly*).

#### **1.4 Temporality in narratives**

English speakers express temporal meanings within and between utterances in their narratives through grammatical forms and lexical items. Grammatical means include use of tense and aspect markings on verbs, and lexical means include use of aspectual verbs and words or phrases from various lexical categories. The following sections will focus on temporality in narratives, and its development.

When telling narratives, speakers generally use either the present tense or the past tense as a reference point around which the story takes place. The tense that is used consistently throughout the narrative is the *anchor tense*. To tell a temporally structured narrative, the speaker must relate the time of each situation that is mentioned (generally labeled *event time*) to the time of speech (*speech time*), or to another specified time (*reference time*) (Bates et al., 1994; Smith, 2009).

When using the present tense as the anchor tense (which is the reference point), reference time and speech time are equivalent. Although speech is anchored in the present, situations along the narrative timeline can refer back to situations that occurred previously, e.g., *The frog is happy that the boy found him*. In this example, the event time for the verb *found* occurs before the speech/reference time (the present). However, it is also possible for the reference time, speech time, and event time to be simultaneous when a narrative is anchored in the present tense, e.g., *The boy looks for the frog*.

A layer of complexity is added when narratives are anchored in the past tense, as the reference time exists in the past, while the speech time is, of course, in the present. Thus, all situations within the narrative are related to the reference time, instead of being related to the speech time, as is the case in narratives that are anchored in the present tense. Event time and reference time can differ, as in the following example: *The frog had been hopping before he fell in the pond*. In this example, the reference time is in the simple past (*he fell in the pond*), while the event time is in the past perfect (*the frog had been hopping*), thus indicating a situation that is more anterior. For narratives anchored in the past, reference time and event time can be equivalent as well, e.g., *The frog hopped over the log*. The important point about narratives that are anchored in the past tense is that the reference time differs from the speech time, while these are equivalent for narratives that are anchored in the present tense. For either type of narrative, situations can occur at various times, i.e., event time may be highly variable. Beyond tense, temporal lexical items, paired with verbs, can establish a reference time, e.g., *James played baseball after he ate lunch* (Smith, 2009). In this example, the adverb *after* relates the time at which James played baseball (the event time) to the time at which he ate lunch (the reference time). Since the past tense is often used as an anchor tense by English-speaking children

(Berman & Slobin, 1994; Colozzo et al., in preparation), and temporal lexical items can be especially helpful in relating situations to the reference time (which is necessary in narratives that are anchored in the past tense), temporal lexical items may play an especially crucial role in English-speaking children's narratives.

More able narrators generally use a consistent or anchor tense to weave events within the story into a narrative timeline, and use tense shifts to delineate background information from the advancing plot (Aksu-Koç & von Stutterheim, 1994; Bamberg, 1987), as illustrated in the following example: *The girls were walking to school. They all have long hair. They saw a bus and waved at it; The kid fell off the monkey bars. His mom came running. She looks worried.* In English, the narrative foreground that consists of the situations that advance the plot (i.e., problem, actions, resolution) generally invites past tense and perfective aspect. Thus, one would expect the simple past to dominate. In certain contexts, the present tense can be used to express situations that are in the past; this usage is called the historic present (Huddleston & Pullum, 2005; Crystal, 2002). This can occur in narratives (Huddleston & Pullum, 2005) or when discussing news (Crystal, 2002). When adults use the historic present, it is generally considered to be a stylistic choice that adds immediacy and a dramatic effect to the narrative (Crystal, 2002; Berman & Slobin, 1994).

Situations that are linked along a narrative timeline allow the plot to advance, as each situation expressed is either sequential or simultaneous, relative to the previously stated situation (Smith, 2009). Within a narrative text, situations fall into three groups based on order of occurrence: (i) *forward sequential*: situations are sequentially ordered, referring forward and advancing the plot, e.g., *The boy noticed his frog was gone, then he went to look for his frog*; (ii) *backward sequential*: a situation refers to a previous one, e.g., *The boy found the frog that he had*

*lost*; and (iii) *simultaneous*: the timing of two situations overlaps in part or completely, e.g., *The boy was sad when he was looking for his frog* (Aksu-Koç & von Stutterheim, 1994). Forward sequential is the default temporal relationship in narratives, though the other relationships are used, to some extent by older children, and more frequently by adults to supplement the plot and add background information and speaker comments, such as opinions or evaluations (Aksu-Koç & von Stutterheim, 1994). By linking the reference and/or speech time to the event time, a contiguous narrative can be formed, weaving sequentially and simultaneously occurring situations into the narrative and advancing the plot to create meaning.

### **1.5 Typical development of temporality in narratives**

TD children progress through several stages on their way to becoming proficient at telling narratives. By the age of 3 years, they seem to interpret pictures as depicting events, meaning that they realize that drawings on a page are representative of situations (Berman & Slobin, 1994). However, throughout their development, many changes occur as children progress through the following stages when they are telling stories from pictures, as presented by Berman and Slobin (1994):

- (i) Describing pictures and linking utterances based on spatial relations.
- (ii) Using an anchor tense and linking utterances by using temporal relations at a local level.
- (iii) Linking utterances temporally and causally with an emerging thematic organization; this entails that narrators are beginning to describe a goal or problem that provides motivation for the narrative's events to unfold, followed by attempts to solve this problem, terminating in a conclusion to the problem (Berman & Slobin, 1994; Norbury & Bishop, 2003).
- (iv) Structuring a globally organized narrative with a theme that ties temporally related clauses together across multiple utterances. Achieving this stage would entail that narrators are

describing the motivating goal or problem of the story, attempts to solve this problem, and finishing the story with a conclusion to this goal or problem.

The next section will describe the development of narrative abilities in English-speaking children through these stages, with a particular emphasis on temporality. The main source for the data reported is a seminal cross-linguistic study completed by Berman and Slobin (1994), wherein children (ages 3, 4, 5, and 9 years) and adults were asked to produce a narrative from a the wordless picture book *Frog, Where Are You?* (Mayer, 1969).

Berman and Slobin reported that, at 3 years of age, children generally described each image in a wordless picture book as an isolated event by using the present progressive, which indicates they were using a picture description mode rather than a narrative mode (Berman & Slobin, 1994). These descriptions were spatially motivated, as children often referred to where on the page events occurred by using the words *here* and *there*. At this age, English-speaking children were able to use the present or past tense grammatically within clauses. However, they switched tenses very often without any apparent motivation to do so and, in contrast to stories told by more advanced narrators, their stories did not have an anchor tense. This led to stories that lacked a temporal organization. When 3-year-olds told narratives, the task was much more interactive than it was with older children, as these children required more prompting to stay on task. However, it is clear that these children were engaged in extended discourse, as they used utterance-initial connectors (e.g., *here*, *and*) to tie their narratives together; thus, although their stories lacked global structure and their productions were more ambiguous than older children's, children in this age group seemed to be connecting pictures in a (spatial) sequence.

At 5 years of age, most English-speaking children anchored the narratives they produced from wordless picture books in either the past or the present ( $\geq .75$  verb phrases in the same



tense; Berman & Slobin, 1994). Some studies indicated that English-speaking 5-year-olds showed a preference for anchoring their narratives in the past tense (Berman & Slobin, 1994; Colozzo et al., in preparation; Handford, 1996). Alternatively, research by Hickmann (2003) found that similar proportions of English-speaking narrators at 4-5 and 7 years of age anchored their narratives in the past and present tenses; it is worth noting, however, that it is unclear whether dialogue was excluded from this analysis or not, which is a context in which the present tense would be expected, possibly affecting these results with relation to those from other studies. Using the past tense requires the speaker to “relate the events depicted in pictures to a fictive world that is not concurrent with the time of speaking” (Berman & Slobin, 1994, p. 66). Most children at this age only occasionally produced present progressive forms, which are generally associated with a descriptive mode of storytelling; researchers report similar rates of present progressive forms constituting 10%-15% of all verb phrases (VPs) (Kowalenko, 2013; Hickmann, 2003). Non-progressive VPs occurred much more frequently in these data, with reported rates of approximately 80% of all VPs (Kowalenko, 2013; Hickmann, 2003), thus suggesting that children’s narratives have developed to be organized in a temporal fashion, as opposed to a descriptive fashion, by 4-5 years of age (Berman & Slobin, 1994; Colozzo et al., in preparation; Hickmann, 2003).

At this age, studies show that the temporal sequencers *then* and *and then* were used frequently (Colozzo et al., in preparation; Berman & Slobin, 1994). English-speaking children and adults used *and* in more than half of their utterances to express either sequentiality or simultaneity, based on context (Hickmann, 2003). Younger participants used temporal connectives to express relations of sequentiality (e.g., *then*, *before*) more so than did older participants; the reverse was found for temporal connectives that express relations of

simultaneity (e.g., *while, when*), which increased between 10 years of age and adulthood for English-speaking children in the Hickmann (2003) study.

Berman and Slobin (1994) noted that the 5-year-olds were a particularly heterogeneous group, as some children had thematically motivated narratives (i.e., narrative plot structures that had an initial motivating problem, followed by attempts to solve the problem, and a resolution to the problem) and others did not. Further, some children used elaborate syntax and vocabulary (i.e., more advanced linguistic expression) in their narrative productions, while others did not. These authors also reported that 5-year-olds either produced a more advanced narrative structure, more advanced linguistic expression, or neither, but not both. Given the high cognitive load of narrative production that arises from coordinating many types of knowledge in real time (Colozzo et al., 2011), these abilities seem to be at a tradeoff: it may have been too difficult for these kindergartners to coordinate more advanced narrative structure with more advanced linguistic expression, even though these children may have been able to do either of these things in less demanding contexts. In contrast, Handford (1996) suggested that 5-year-old children who anchored their narratives in the past tense had more complex plot structures. Using an anchor tense could be related to other elements of language development. This hypothesis could be explored further, as the results were not clear-cut in this respect, and the sample was small in both studies.

Until recently, only limited information regarding the development of narrative temporality in the early elementary school years was available, as Berman and Slobin (1994) had not considered the intervening years between 5 and 9 years of age and Hickmann (2003) had children produce short, simple stories. In a recent study with three groups of English-speaking children from Kindergarten to Grade 2 (aged 6, 7, and 8 years), most participants used an anchor

tense in their narrative productions from two multi-episode wordless picture books, and for the majority this was the past tense (Colozzo, et al., in preparation). This study found no differences between children in different grades (Kindergarten to Grade 2) in the use of anchor tense or of temporal lexical items. The cross-linguistic study by Hickmann (2003) examined narratives produced by adults and children at ages 4-5, 7, and 10. She found that the majority of English-speaking children used an anchor tense (at age 4-5, 90% of narratives; at age 7, 97.5% of narratives), but the anchor tense could be either the present (40% and 47.5% of narratives) or the past (50% of narratives). Across studies, researchers found that temporal simultaneous connectors occurred infrequently in narratives, representing 13-16% of connectors across the groups of children studied by Hickmann (2003), and occurring about once per 50 VPs (so approximately 2% of clauses) across the groups studied by Colozzo and colleagues (in preparation). Neither of these researchers found age-related changes in English-speaking children's usage of temporal simultaneous connectors (i.e., *when*, *while*, *meanwhile*, *as*) between the ages of 4-5, 7, and 10 (Hickmann, 2003) and between Kindergarten and Grade 2 (i.e., 5 to 8 years; Colozzo et al., in preparation).

Children with less advanced narrative skills often did not use an anchor tense and were limited in the ways they expressed tense and aspect, as they mainly used present progressive forms, indicating a picture description mode (Berman & Slobin, 1994). In contrast, Colozzo and colleagues (in preparation) noted that children who used longer utterances (measured by MLU in words) and who produced stories with greater lexical diversity (measured by number of different words, NDW) also produced more advanced temporal features (nonfinite progressive VPs, e.g., *the dog chased the cat with the frog following him*; aspectual verbs, e.g., *they stopped building it*; and temporal expressions besides sequencers, e.g., *meanwhile, the frog was hopping*) in their

narratives, indicating that these abilities may be linked. It thus seems possible that children with more advanced language skills may be more advanced across various domains of narrative production, as had been proposed by Handford (1996) based on a sample of 5-year-olds.

Research by Hicks (1990) suggests that, by Grade 2, TD children are able to tell narratives in a tense that is expected for the task: telling an online event recast (akin to a sportscast) in the present tense, but telling a narrative about a film they had watched earlier in the past tense. Children in Kindergarten and Grade 1 were more influenced by the order in which the experimental tasks were presented than children in Grade 2, as the pragmatic characteristics of the younger children's narrations in the first task they performed often predicted these characteristics (including tense) in subsequent tasks; for example, if these children performed the news reporting task in the past tense (as expected) before the online event recast, they were more likely to also produce the online event recast in the past tense (contrary to expectations). This may illustrate decreased inhibition of preceding material for younger children, which may have influenced the results obtained in this study. This also suggests that younger children may still be developing the ability to use an anchor tense in their narratives. Importantly, however, the data found by Hicks (1990) represented group means for tense distributions rather than individual-level anchor tense data.

Within narratives, 5- to 8-year-old children were able to appropriately use the present tense when using dialogue, regardless of whether their narratives were anchored in the present or past tense (Colozzo, et al., in preparation). However, Berman & Slobin (1994) and Hickmann (2003) reported that 4-5-year-olds were not as likely as older children to use tense shifts to distinguish between situations in the foreground and background, which can indicate that situations overlap, e.g., *the boy was calling the frog. The frog ignores him.*

By 9 years of age, TD children are familiar with formal schooling, are gaining knowledge from written texts, and are expected to learn the content of what they have read instead of focusing on decoding the words. Berman and Slobin (1994) reported that, when telling narratives, most children at this age chained events both causally and sequentially, which contrasts with the performance of children at younger ages. The key components of the plot (i.e., an initiating motivating event that introduces a problem or a goal, attempts to resolve the problem or achieve the goal, and a conclusion of the problem or attainment of the goal) were present at this age. When presenting a series of situations, 9-year-olds tended to present them temporally by using both earlier-emerging temporal lexical items *then* and *and then*, as well as later-emerging temporal lexical items, such as *after*, *first*, *until*, and *still*; these later-emerging forms were more frequent in these children's narratives than in narratives from younger children. Nonfinite verbs are of interest regarding temporality because, although they are unmarked for tense, they are often used to relate simultaneous or overlapping situations, e.g., *and they were walking looking at butterflies* (Aksu-Koç & von Stutterheim, 1994; Colozzo et al., in preparation; Hickmann, 2003).

Berman and Slobin (1994) reported that 9-year-old children made more of a distinction than 5-year-olds between the foreground—situations that move the plot forward in time—and the background—supplementary information that adds complexity to the plot. Nine-year-old children in this study weaved situations throughout the main storyline by using prospection to refer forward to expected outcomes, and retrospection to refer backward to circumstances that motivated the plot to develop, such as the frog escaping from the child's bedroom at the beginning of the story. Using these types of relations assists in developing a thematic background. Further, 9-year-olds were shown to refer to characters' states of mind (e.g., *the boy*

*is happy because he found his frog*) more often than younger children, as 80% of English-speaking 9-year-old children attributed emotions to a protagonist.

The results from Berman and Slobin (1994) indicate that, when telling narratives, adults exhibit various skills that children do not seem to have mastered yet, including the frequent use of selective tense shifts that deliberately add to the narrative content. These tense shifts can be either local (i.e., contrasting the tense with the surrounding context) or extended (i.e., motivated by the global structure of the narrative). Tense shifts made by adults were rarely erratic, or seemingly unmotivated, in contrast to some tense shifts by 3-year-olds and 5-year-olds, which occurred more frequently with less apparent motivation. Nine-year-olds switched tenses rarely, showing a preference for telling narratives in a more straightforward, but less complex, manner; however, they rarely produced erratic tense shifts like younger children, showing more maturity than younger children, but less flexibility than adults. Global, thematically motivated tense shifts produced by adults helped to embed situations in elaborate background circumstances, including the narrator's evaluations of situations and attributions of characters' mental states (Berman & Slobin, 1994). Further, the descriptions of mental states used by adults were much more elaborate than the descriptions used by 9-year-olds.

Hickmann (2003) found that the use of temporal simultaneous connectors (e.g., *as*, *when*, *while*, *at the same time*) increased between 10 years of age and adulthood, but was mostly stable in the younger age groups, which suggests that linking situations with connectors that express simultaneity may be a later-emerging skill. This is in accordance with research by Colozzo and colleagues (in preparation) that did not find a significant increase in usage of temporal simultaneous connectors before age 9.

Adults' narratives were found to have a large amount of individual variability, likely showing more developed stylistic preferences than seen in children and reflecting advanced skills (Berman & Slobin, 1994). The developmental continuum explained above shows what can be expected from TD children over a variety of ages on the complex task of producing a narrative from a sequence of pictures or a wordless picture book.

To recap, Colozzo and colleagues (in preparation) and Berman and Slobin (1994) found that children between 5 to 8 years of age were generally able to use an anchor tense when producing narratives, with a preference for the past tense; this preference was not shown in data from Hickmann (2003), likely because of task differences. Children did not often shift tenses within their narratives, and when they did so, these shifts were contextually motivated; examples included shifting from a story anchored in the past tense to dialogue in the present tense, or shifting from a story anchored in the past tense to describe a background detail in the present tense (Colozzo et al., in preparation). Progressive forms were rare in data from prior studies, and present progressives represented a minority of VPs, suggesting that children were generally in a narrative rather than picture-description mode (Berman & Slobin, 1994; Colozzo et al., in preparation; Hickmann, 2003). Children at this age expressed aspectual meanings by using diverse lexical items, but temporal simultaneous connectors (e.g., *while*, *as*) were rarely used. Within this age range, individual children's narrative productions varied greatly (Berman & Slobin, 1994; Colozzo et al., in preparation). Some children showed more advanced profiles based on other indicators from their story texts and also used more advanced temporal forms, and the opposite was true for some children with less advanced profiles, who performed similarly to younger children at this task (Berman & Slobin, 1994; Colozzo et al., in preparation).

Given the fact that children with SLI are less advanced in their language development, they may perform similarly to less advanced TD children, perhaps showing difficulty using marked verbs, being less likely to establish an anchor tense, and using more advanced temporal forms less frequently, such as aspectual verbs and diverse temporal lexical items beyond the basic sequencers (e.g., *and then, then*). On the other hand, a dichotomy may be present between the grammatical means and the lexical means that children with SLI use in the service of temporality, in that they would exhibit stronger lexical skills. The next section will provide background for this alternative hypothesis.

## **1.6 Narrative development in children with SLI**

As discussed previously, the task of producing a coherent, content-rich, and grammatical narrative is demanding for all children. Children with SLI come to such tasks with more limited language knowledge as well as generally more limited working memory capacity than TD peers (Leonard, 2014); this likely makes online narrative production particularly challenging for them (Colozzo, et al., 2011). Much research has highlighted difficulties in content, structure, and form in the narratives produced by children with SLI (see Colozzo et al., 2011, for a review). Yet, few studies have looked at the temporal properties of narratives in school-aged children with (or without) SLI.

A particular area of difficulty for English-speaking children with SLI is marking tense and agreement on verbs (Leonard, 2014; Rice & Wexler, 1996). Cross-linguistically, children with SLI have difficulty acquiring the tense and aspect systems of their language (Leonard, 2014; Leonard, 2015). These difficulties are more pronounced for children with SLI acquiring English, as compared to some other languages (e.g., Spanish), since English does not



consistently mark tense and agreement, which seems to make these grammatical rules more difficult to learn (Bedore & Leonard, 2001).

Given the task demands of narrative production, difficulties with expressing temporal relations are likely to be particularly apparent when children with SLI produce narratives, and this could hold for an extended developmental period. As argued earlier, even children who produce grammatically accurate utterances that express temporal relations in several contexts may struggle to do this when producing narratives, due to the complex task demands that narrative production poses; these effects may be especially noticeable for children with SLI.

Moore and Johnston (1993) showed that 5-year-old children with SLI exhibited a relative strength in the usage of temporal adverbs as compared to tense markings. In this study, children with SLI and TD children completed sentences with the appropriate temporal adverb or tense-marked verb, related to sets of pictures that showed ‘before’ and ‘after’ relations of various actions. For example, when children were asked to help a forgetful puppet tell a story of a child washing his hands based on a sequence of pictures, the child would have to fill in the blanks left in the puppet’s story, as indicated by the following underlined segments: “*This is Mom* [indicating a corresponding picture]. *Mom said ‘Wash your hands very soon,’ But, look at John’s clean hands* [indicating a second picture]. *John said, ‘I did wash them. I washed them a few minutes ago’.*” (Moore & Johnston, 1993, p. 521). Children also performed this task with different scenarios that were acted out by the puppet in the same manner by filling in the blank with a verb in the past tense. Additionally, these children responded to wh-questions about the timing of a personal narrative that they had told spontaneously (e.g., when they had gone to the zoo). The results of this study showed that 5-year-old children with SLI resembled 3-year-old TD children in their production of tense markings, but 4-year-old TD children in their production

of temporal adverbs. Thus, these children with SLI showed relatively stronger lexical than morphological skills.

Colozzo and colleagues (2011) found that many English-speaking children with SLI in Grades 2 to 4 exhibited more difficulty in one area of language production (i.e., either content or form) than the other when producing a narrative. Compared to TD peers, these children with SLI showed delays in both content and form; however, analysis of individual-level data revealed that children exhibited the aforementioned relative strengths and weaknesses. These results indicate that school-aged children with SLI may exhibit heterogeneous language profiles, so it is helpful to examine trends in data that may be informative regarding certain children's narrative abilities that may not apply to the entire group of children with SLI.

Studies examining Cantonese-speaking children with SLI provide interesting data, since tense is not expressed in Cantonese; rather, temporality is expressed through use of adverbs and aspectual markers. Thus, aspect is expressed distinctly in Cantonese, which helps to determine whether children with SLI have difficulty with aspect when it is not confounded by tense (whereas in English tense and aspect are both expressed on the VP using common morphological markers). The temporal adverbs used in Cantonese provide grammatical information, but little semantic content (i.e., they are closed-class words). Cantonese-speaking children with SLI used fewer closed-class words than TD language-matched children in spontaneous speech samples (Stokes & Fletcher, 2000). However, children with SLI used verbs and nouns, which inherently have more semantic content (i.e., open-class words), more frequently than TD language-matched children, showing that their difficulties seemed to be most pronounced when using words that encoded grammatical meanings (Stokes & Fletcher, 2000). This suggests that, even in a language

that does not have a morphological system for tense and aspect, children with SLI show grammatical abilities that are more affected than their semantic abilities.

Deaf children with SLI show the same types of delays in narrative productions in British Sign Language compared to deaf children without SLI as hearing children with SLI show in spoken languages compared to TD peers—namely difficulties in morphological and grammatical agreements in their narratives (Herman et al., 2014). Despite the difference in modality used to express language, these children showed similar patterns of difficulty.

Krantz and Leonard (2007) reported that when 4- to 6-year-old English-speaking children with SLI heard a temporal lexical item in a sentence in addition to a marked verb, they were less likely to produce the past tense in a sentence completion task than if they heard a sentence with a marked verb that lacked a temporal lexical item. For example, children with SLI in this study were more likely to use a marked verb to respond to “Woody covered Piglet and Buzz \_\_\_\_\_ (opened his big bag)” (Krantz & Leonard, 2007, p. 141), than “A little while ago, Cookie Monster hopped over his lion and a little while ago, Bert \_\_\_\_\_ (carried his big basket)” (Krantz & Leonard, 2007, p. 140). The authors hypothesized that redundancy of past tense cues may lead young children to omit obligatory tense markings in these scenarios. This phenomenon was found for both children with SLI and their younger, language-matched, peers; their age-matched peers did not show this effect. This may indicate that, as TD children gain experience with language and produce utterances that increase in length and complexity, this phenomenon disappears. At this point, it is unknown whether children with SLI similarly are less likely to exhibit this pattern of response when they are older and have more language knowledge and more extensive language experience, or whether the presence of temporal adverbials in a sentence might continue to be associated with the absence of obligatory tense markings.

Moreover, as mentioned above, lexical items with a temporal quality are associated with syntactic patterns that vary in grammatical complexity.

Cross-linguistic studies examining speech samples from children with SLI who speak Arabic, Cantonese, Hungarian, and English all showed that these children have a more prominent delay in grammatical aspect than younger, language-matched children (Leonard, 2015). This effect is shown although these languages express aspect in varied ways, some inextricable from tense (such as English), and some independent from tense (Leonard, 2015). Thus, it seems difficult for children with SLI to express grammatical aspect, as well as tense, in the same way as TD peers.

To recap, studies have shown that children with SLI have particular difficulty using grammatical markings and closed-class words to express relations of tense and aspect (Herman et al., 2014; Leonard, 2015; Moore & Johnston, 1993; Stokes & Fletcher, 2000); some studies compared this difficulty to these children's stronger lexical and/or semantic skills (Moore & Johnston, 1993; Stokes & Fletcher, 2000). Creating a narrative involves sophisticated use of language, in order to relate events to one another in time, and to tie the narrative together over multiple utterances in the service of the overall plot. Colozzo and colleagues (2011) showed that children with SLI show relative strengths and weaknesses in content and form during narrative production. To this author's knowledge, temporality has not been the main focus of any study of children with SLI who produced extended discourse, although some studies have focused on elements of narratives that are relevant for temporality. Some studies have looked at certain elements of the microstructure of children's narratives, such as the use of coordinating and subordinating conjunctions (Justice et al., 2006; Liles et al., 1995). Children with SLI were found to produce fewer subordinating conjunctions per clause than TD peers (Liles et al., 1995).

Temporal relations are expressed by these conjunctions, making this finding relevant for the current study.

The present study will examine a wide variety of morphological and lexical temporal markers, and compare children's productions of these lexical temporal markers with their productions of grammatical tense and aspect markings. Creating a narrative is a complex and cognitively demanding task, especially for children with SLI. These children often show stronger lexical than morphosyntactic skills, which provides a basis for this study's research questions.

### **1.7 Research questions**

The current study aims to add to the body of research concerning temporality in the narrative productions of children with SLI. As mentioned above, temporality is important for narrative coherence and interest. Moreover, narrative discourse is used as a context of assessment and intervention for children with SLI. It would thus seem important to describe the temporal narrative abilities of children with SLI and to compare them to those of TD peers.

The current study sets out to answer the following research questions, for which we formulated hypotheses based on the limited prior evidence:

- i. Do 5- to 8-year-old children with SLI mark tense in obligatory contexts less often than TD peers when producing narratives?
- ii. Do 5- to 8-year-old children with SLI use a consistent verb tense (i.e., anchor tense) throughout their narratives less often than TD peers when producing narratives?
- iii. Do 5- to 8-year-old children with SLI perform more similarly to TD peers in their production of temporal lexical markers, as compared to their use of grammatical temporal markers when producing narratives?

We expected that, compared to TD peers, children with SLI would:

- i. less frequently mark tense in obligatory contexts,
- ii. less frequently use a consistent verb tense throughout their narratives, and thus be less likely to have an anchor tense.
- iii. perform similarly with respect to their production of temporal lexical items.

Support for hypothesis (i) would be in accordance with past research, as delay in the development of verb morphology is well-documented in the SLI population (Tager-Flusberg & Cooper, 1999; Leonard, 2014), including during narrative production tasks (Norbury & Bishop, 2003). Support for hypothesis (ii) may also be expected, given that younger TD children do not have an anchor tense when telling narratives (Berman & Slobin, 1994), and some 5- to 8-year-old TD children who may be less linguistically advanced produced narratives without an anchor tense (Colozzo et al., in preparation). Thus, these features may be seen in the narratives of children with less mature language abilities, including children with SLI. Support for hypothesis (iii) would indicate that children with SLI continue to be further advanced in their lexical over their morphological development in the early school years while performing a challenging task. Further, it is possible that temporal lexical items that do not require complex grammatical constructions could occur more frequently in the narratives of children with SLI than temporal lexical items that require complex grammatical constructions. Krantz and Leonard (2007) found that when children with SLI were asked to complete a sentence that included a temporal lexical item that referred to the past (e.g., *a little while ago*), they were relatively less likely to mark the past tense appropriately, perhaps due to redundancy of past tense cues and their difficulties with marking tense. Since the experimenter produced the temporal lexical item, the children were aware that she knew the event had already happened; thus, marking the past tense lacked

communicative importance in this situation, which may have led the children with SLI to omit the past tense marker.

Chapter 2 describes the method used to investigate this study's research questions. Chapter 3 describes the results found in this study. Chapter 4 integrates this study's results into the background literature, and provides individual-level data to supplement findings presented in the preceding chapter. Chapter 5 concludes the thesis, comments on the study's research questions and limitations, and provides recommendations for future directions.

## Chapter 2: Method

This study uses archived data from two prior projects that included both TD children and children with SLI aged 5 to 8 years (Colozzo et al., in preparation; Frick, 2012; Whitely & Colozzo, 2013). All procedures were reviewed and approved by the Behavioural Ethics Board of the University of British Columbia. This chapter provides details about participant characteristics, elicitation of data, coding, and analysis.

### 2.1 Participants

This study included data from 28 pairs of children ( $N = 56$ ) aged between 5 and 8 years (see Table 2.1 for details), with each pair consisting of a child with SLI and an age-matched TD child. Four children with SLI were excluded for the following reasons: (1) one child did not complete the narrative according to the elicitation protocol (i.e., did not look at the pictures in the books before telling the narratives); (2) another child required the experimenter to provide a high level of prompting that could have influenced grammatical tense/aspect (i.e., “can you tell me what is happening in this picture?”); (3) two children produced fewer than 10 VPs per story in the main narrative (i.e., excluding dialogue), which was considerably below the average for the group (i.e., more than 30 VPs per story; see Results) and were deemed to provide insufficient data for analysis.

Participants in the TD group were monolingual, with no evidence of language or developmental learning difficulties, and no known hearing loss. Teachers distributed information/consent packages exclusively to students who they thought met these criteria, which was later confirmed through a parental questionnaire and a hearing screening.

Children with SLI were identified by school-based speech-language pathologists (SLPs) from their caseloads. A parental questionnaire was then administered, which made it possible to



verify whether these children had difficulties with language, but no other genetic or medical conditions, and were monolingual speakers of English.

Table 2.1

*Participant demographic data*

Group	Gender	Age (years)	Maternal education (years)
	Male: Female	<i>M (SD)</i> range	<i>M (SD)</i> range
TD ( <i>n</i> = 28)	21:7	6.77 (0.85) 5.58-8.33	14.8 (2.1) 11-18
SLI ( <i>n</i> = 28)	17:11	6.85 (0.83) 5.50-8.33	14.7 (2.6) 11-20

*Note.* Data regarding maternal education was not reported for one child with SLI.

**2.1.1 Matching**

In this group comparison study, each child with SLI was matched with a TD child based on the following criteria:

- i. Grade: All participants were matched with a child in the same grade.
- ii. Age: Children in each matched pair were no more than 6 months apart in chronological age; a paired samples t-test confirmed that the groups did not differ in age in months ( $t = -.60; p = .56$ ).
- iii. Gender: When possible, the gender of matched participants was the same. A Fisher's exact test confirmed that the groups did not differ with respect to gender distribution ( $p = .39$ ).

- iv. Maternal education: Participants were matched based on maternal education; a paired samples t-test confirmed that the groups did not differ for mothers' years of schooling ( $t = .41; p = .69$ ).

## 2.2 Materials and procedures

Each child completed a number of experimental tasks as part of a larger study, including various short-term memory and memory updating tasks (see Whitely & Colozzo, 2013, for more information on these tasks). Tasks of interest for this study include:

- the Test of Language Development Primary, 4th Edition (TOLD-P:4),
- the Matrices subtest of the Kaufman Brief Intelligence Test, 2nd Edition (KBIT-2),
- a hearing screening, and
- two narrative productions from wordless picture books, *Frog on His Own* (Mayer, 1973) and *April Fools* (Krahn, 1974).

Testing spanned two or three sessions with an experimenter in a quiet room in the children's schools or homes. The standardized tests were administered first, followed by other experimental tasks and, lastly, the narrative tasks. This allowed children to become more familiar with the experimenter before completing the narrative production task, potentially making them more comfortable when it came time to complete this less structured task. The experimenter did not provide specific feedback regarding the child's performance on any task, but rather only gave general encouragement.

### 2.2.1 Tests for inclusion criteria of children with SLI

The TOLD-P-4, the Matrices subtest of the KBIT-2, and a hearing screening were administered to determine that the children met the selection criteria for participation in the SLI group. Standard administration and scoring protocols were followed for the standardized tests.

The TOLD-P-4 was used to determine whether children qualified as language impaired for the purposes of this study. Its six core subtests that together make up the Spoken Language Composite assess language comprehension and production in the areas of vocabulary, semantics, and morpho-syntax. For the purpose of this study, an inclusion criterion of two or more subtest standard scores at or below 1 standard deviation below the mean was used; subtest standard scores obtained by individual participants are included in Appendix A. The mean for the Spoken Language Composite was 81.1 (range 65-96).

The Matrices subtest of the KBIT-2 assesses children's nonverbal cognition. By definition, to be classified as having SLI, it is necessary that children present with a language impairment in the absence of a global developmental delay (Leonard, 2014). Using the same criteria as Frick (2012) and Gillam and colleagues (2008), children were required to score no more than 1.66 standard deviations below the mean on this subtest (standard scores  $\geq 75$ ) to be included in the sample. The scores obtained by each of the children in the current sample were within the normal range ( $M = 98.4$ ,  $SD = 13.8$ , range = 81 - 132)

A hearing screening was completed at 20 dBHL at 1, 2, and 4 kHz in each ear. Children were considered to have passed the hearing screening if they responded to all frequencies tested at 20 dB. All children passed this hearing screening.

### **2.2.2 Narrative tasks**

The data that are most relevant for this study's research questions come from the narrative production tasks. Wordless picture books are often used by clinicians and experimenters to elicit narratives from children of this age. They provide a sequence of pictures that tell a story in a book format, which is familiar to school-aged children. The picture-book

format makes the narratives readily comparable across children while allowing for individual variability. Two narratives were elicited so that more data would be available for analysis and to increase the likelihood that each child's sample would be representative of his or her abilities. Since verbs that should be marked with tense appear in most sentences, these narratives provide a large amount of data for analysis. The books used in this study, *April Fools* (Krahn, 1974; henceforth *AF*) and *Frog on His Own* (Mayer, 1973; henceforth *FOHO*) are visually comparable (black and white drawings) and in terms of length (25 to 27 pictures) and complexity (multiple episodes). Both stories depict multiple action sequences and co-occurring situations (see Colozzo & Whitely, 2015, for a detailed description of each story). Since there are many similarities between these books, it is possible to view them as tasks of the same difficulty. However, the fact that these books have different stories and structures might result in more diverse linguistic forms.

Each child was given one wordless picture book at a time, and encouraged to flip through it and think of a story to tell to go with the pictures. The experimenter told the child that she would record the story so that her friend could listen to it later. The experimenter mentioned that the friend would not be shown the book, so the child would have to tell the best story he or she could tell. The child informed the experimenter when he or she was ready to begin, and then told his or her story while turning the pages of the book. After the first story had been completed, the same process was repeated for the second story. The narrative productions were audio- and video-recorded for later transcription.

### 2.2.3 Transcription and coding of the narratives

Children's narrative productions were transcribed orthographically and segmented into communication units, i.e., C-units (Loban, 1976). They were also coded for tense, aspect, and lexical markers of temporality.

#### 2.2.3.1 Transcription

Trained graduate students transcribed the narratives using the Systematic Analysis of Language Transcripts software (SALT; Miller & Iglesias, 2012) and segmented them into C-units following the criteria outlined by Loban (1976). C-units consist of main clauses along with any dependent phrases and clauses. Coordinated clauses (using *and*, *but*, *or*) were treated as separate C-units except in cases where the co-referential subject of the second clause was omitted (e.g., *This frog saw a fly and Ø decided to get it*). Unintelligible and abandoned C-units, mazes (i.e., false starts, retraces, and repetitions), digressions, and task-oriented comments were excluded from the narrative text. If a narrator included something spoken by one of the characters in the character's own words and voice, this was considered *dialogue*. Another coder verified the accuracy of transcription and segmentation. Discrepancies that were not obvious errors or omissions were discussed with a third judge. For the sample of children with SLI in particular, this resulted in many transcripts being reviewed in part or in full by two listeners (in addition to the original transcriber) and a consensus was reached with respect to the final transcription.

#### 2.2.3.2 Grammatical markers

All VPs in the main narratives (excluding dialogue) were coded for grammatical tense and grammatical aspect. *Complex VPs* consisting of verb chains (tensed verb + infinitive or participle) were not decomposed (e.g., *He wants to eat; One of the boys tried looking for a way*

out). Each VP was coded as *present*, *past*, *neutral*, or *bare*. Neutral VPs are ambiguous with respect to tense (e.g., *They put it down*) or unmarked for tense (i.e., nonfinite progressive clauses, e.g., *She saw him cutting it*)<sup>1</sup>. *Bare* forms correspond to VPs where the main verb or the auxiliary is unmarked or absent in a context where this is not grammatical (e.g., *He \*build a dragon*; *She ∅ watching the frog*). Tense shifts between consecutive VPs were coded based on a *present* or *past* dichotomy. Tense shifts in the main narrative were considered separately from tense shifts within dialogue, and only tense shifts in the main narrative were analysed herein.

Each VP was coded for aspect based on a *simple* or *progressive* dichotomy. Progressive verbs were further divided into four categories. *Basic* (or canonical) *progressives* include the *be* auxiliary and a progressive (e.g., *he was laughing*), or a semimodal verb and an infinitive (e.g., *she is going to run*; *she is gonna jump*). *Compound progressives* include another auxiliary (*have* for perfect tenses; modal auxiliaries) in addition to the *be* auxiliary, followed by a progressive (e.g., *they have been looking*; *she had been thinking*; *he will be running*). *Complex progressives* are composed of a lexical verb, followed by a verb in the progressive form (e.g., *he tries finding*; *she starts running*; *they stopped looking*). *Nonfinite* (i.e., untensed) *progressives* occur when a tense marking is unnecessary, as the progressive is part of a subjectless clause with a nominal or adjectival function, e.g., *He likes the painting with the girl waving in it*. A detailed coding scheme for tense and aspect is included in Appendix B.

Each of the two narratives (one per story) that each child produced was analysed to determine if it had an anchor tense in the main narrative according to the following criteria:

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<sup>1</sup> Imperatives would also be considered unmarked for tense, but they did not occur in the main narrative.

i) 50% or more of VPs were marked (i.e., bare VPs represented less than 50% of total VPs); and  
ii) 75% or more of the unambiguously marked (i.e., past or present) VPs within a single story were in the same tense (either past or present). Neutral and bare VPs were excluded from this analysis, as they do not fit into either of the categories of present or past from which anchor tense is calculated (Berman & Slobin, 1994; Colozzo et al., in preparation).

### 2.2.3.3 Lexical markers

Lexical items with a temporal quality were first identified based on the words produced by a larger sample of TD children (Colozzo et al., in preparation). That list was augmented as needed based on the words produced by the sample of children with SLI in the current study.

All lexical items with a temporal quality were subdivided based on the following categories, following Berman and Slobin (1994), Colozzo and colleagues (in preparation), and Hickmann (2003):

1. Aspectual verbs: Aspectual verbs add a layer of information beyond what is expressed through grammatical (i.e., progressive) aspect in English. Aspectual verbs were identified following the meaning categories proposed by Berman and Slobin (1994). The aspectual verbs that appeared in the current data set fell into the following categories: (i) *inceptive*, *inchoative* or *ingressive*: entering a state or inception of a process (*start, get, become*); (ii) *lative*: moving or changing location in order to do something (*go, come, run*); (iii) *continuative* or *protracted*: continuation of a state or duration of an activity (*keep (on), carry on*); (iv) *completive*, *cessive*, or *egressive*: termination or coming to an end of a process (*stop, be done, finish*); (v) *achievement*: reaching a goal (*manage*); (vi) *imminent*: on the point of occurring (*be about to; going to*). *Get* was treated as an aspectual verb when it marked the beginning of a state. For example, *He got scared* marks the beginning of the state of being

scared. This can be contrasted to *He was scared*, which refers to the same state of being scared without referring to the starting point. *Go* was treated as an aspectual verb when it was used to mark the beginning of an event, when a character is said to go do something (e.g., *and they go grab a ladder; they went to find the monster*). Declerck (2006, p. 108) noted that, when followed by a verb, *is going to* acts similarly to *is about to*, which is considered an aspectual verb.

## 2. Connectors

2a) All-purpose connectors: the coordinating conjunction *and* may serve to link situations in a simultaneous or sequential way, dependent on the context, but is ambiguous in this respect. Only instances where *and* was used to coordinate VPs were included.

2b) Sequencers: these words move the narrative forward in time at a local level by providing a sequential link between one utterance and the next (e.g., *and then, then*).

2c) Sequential temporal connectors: these words also provide a sequential link, but they have a more specific meaning than the sequencers (e.g., *before, after, now, next*).

2d) Simultaneous temporal connectors: these words link situations that occur at the same time or are partially overlapping (e.g., *while, when, meanwhile, as*).

If there was a simultaneous or sequential temporal lexical item directly following *and* (e.g., *and then, and next, and while*), the pair of lexical items was coded according to the second lexical item. In such cases the all-purpose (i.e., ambiguous), connector was disambiguated.

3. Other temporal expressions: these words serve a variety of functions related to time, such as providing an exact time point (e.g., *tomorrow, yesterday, at 6 o'clock*), or expressing continuity (e.g., *every weekend*).



A list of all temporal lexical items that occurred in the current data set, by sub-category, is available in Appendix C. Note that words or phrases that appeared in formulaic story starters (*once upon a time, once, one day*) or story closings (*happily ever after*) were not included.

#### **2.2.3.4 Repetition of VPs**

We coded for VPs that were repeated to express duration (e.g., *they walked and walked*), as this is akin to the meaning expressed with aspectual verbs that indicate continuation or protraction (e.g., *keep on*). Repetitions of words other than verbs tended to express other (i.e., non-temporal) meanings, such as quantity (*he found lots and lots of flies*), spatial location (*he chased the butterfly around and around*) or extremity (*he was really really really scared*), and thus were not considered.

#### **2.2.3.5 Exclusion of dialogue**

Utterances that occurred in dialogue were excluded from the analyses. A high proportion of tense shifts and more frequent use of the present tense are expected within dialogue for TD children (Colozzo et al., in preparation). This makes analysis of dialogue less pertinent to the current research questions, due to the expected similarity between groups in this respect.

### **2.3 Analyses**

The general analysis strategy involved a repeated measures model ANOVA of group (2) by story (2) for each dependent variable. To control for differences in productivity, variables were converted to rates or proportions, as appropriate. Arcsine transformed values were entered into all ANOVAs, but marginal means based on untransformed values are reported for ease of interpretation. A few analyses compared distributions, and accordingly used chi-squared or Fisher's exact tests.

## **Chapter 3: Results**

This chapter presents results of analyses of grammatical and lexical markers of temporality in the narratives of TD children and children with SLI. Data reported below concerns productions in the main narrative only (i.e., excluding dialogue). These results address the research questions, regarding expectations that children with SLI will less frequently mark tense in obligatory contexts, less frequently use a consistent verb tense throughout their narratives, and show relative strengths in their use of lexical over grammatical markers of temporality.

### **3.1 Story characteristics**

TD children and children with SLI produced stories of comparable length in words as well as comparable numbers of VPs in the main narrative for each story. This provided a rich data set for analysis. In both stories, TD children produced fewer C-units but had a higher mean length of utterance (both in words and morphemes) compared to children with SLI. This indicates that the two groups produced stories of similar length, but the C-units that children with SLI produced were often shorter. See Table 3.1 for details.

Table 3.1

*Story characteristics*

Story	Measure	Group	
		TD	SLI
April Fools	NTW	200.4 (72.3)	199 (62.7)
		49-372	76-304
	C-units	25.7 (6.8)	33 (7.7)
		13-40	17-55
	MLU-w	7.7 (1.8)	6.1 (1.2)
		5.8-12.3	3.9-9.1
	MLU-m	8.5 (1.8)	6.7 (1.2)
		4.4-13.5	4.3-9.9
	NTVP	32.9 (11.6)	33.3 (9.3)
		13-63	16-52
Frog on His Own	NTW	244 (77.3)	234.3 (67.2)
		81-370	65-383
	C-units	33.3 (9.4)	39.6 (9.6)
		14-57	13-62
	MLU-w	7.3 (1.4)	5.9 (1.0)
		3.7-9.9	3.9-7.8
	MLU-m	8.1 (1.4)	6.4 (1.0)
		5.0-10.8	4.1-8.6
	NTVP	39.7 (11.6)	38.4 (11.2)
		16-64	10-64

*Note.* Means (*SDs*) and ranges for number of total words (NTW), number of C-units (C-units), mean length of utterances in words and in morphemes (MLU-w, MLU-m), and number of total VPs (NTVP).

## 3.2 Tense

Tense use patterns by TD children and children with SLI were analysed for the main narrative (i.e., excluding dialogue), by story. This section describes the distribution patterns, as well as patterns regarding anchor tense.

### 3.2.1 Tense distribution

All VPs in the sample were coded as *present*, *past*, *neutral*, or *bare*. We first considered whether the groups differed with respect to bare VPs. A minority of TD children failed to mark at least one VP in an obligatory context. In AF, three TD children produced one or more bare VPs, and in FOHO, two TD children did. TD children who produced any bare VPs produced 1 to 3 in a single story, constituting 2% to 19% of VPs. Many more children with SLI produced one or more bare VPs; this was the case for 23 children in AF, and 24 children in FOHO. Children with SLI produced 1 to 32 bare VPs in a single story, constituting 2% to 67% of VPs. See Table 3.2.

Given that TD children rarely produced bare VPs, the distributions did not meet assumptions for inferential statistical tests comparing means. Consequently, the number of children who produced at least one bare VP in their narratives in each group were considered. Chi-squared tests revealed that there was a significant association between group and whether or not children produced any bare VPs for each story: AF,  $\chi^2(1, N = 56) = 25.9, p < .001$ , Cramer's  $V = .72$ ; FOHO,  $\chi^2(1, N = 56) = 31.7, p < .001$ , Cramer's  $V = .79$ . These results show that, compared to TD peers, more children with SLI did not mark tense in an obligatory context at least once.

TD children and children with SLI used similar proportions of neutral VPs (i.e., VPs that are grammatically correct, though their tense marking is ambiguous or absent; e.g., *they put*; *The woman held her baby with the cat chasing the frog*). Both groups showed a strong preference for using the past tense over the present tense, and the past tense was the modal category for each story. See Table 3.2 for details. It is also noteworthy that some children produced overgeneralization errors when attempting to produce the past tense (e.g., *they \*standed*; *he \*goed*), and this was less frequent in the narratives of TD children (24 total errors, average 0.86 errors per child) than those of children with SLI (75 total errors, average 2.68 errors per child). Furthermore, 11 TD children produced one or more overgeneralization errors in their narratives compared to 21 children with SLI.

Table 3.2

*Mean numbers of VPs (and SDs) produced by tense category*

Story	Tense	Group	
		TD	SLI
April Fools	Present	6.8 (12.2)	9.0 (6.1)
	Past	22.9 (14.5)	18.0 (12.2)
	Neutral	3.0 (2.2)	2.3 (2.1)
	Bare	0.2 (0.7)	4.0 (5.1)
Frog on His Own	Present	6.0 (12.2)	5.4 (6.3)
	Past	32.0 (16.8)	26.1 (13.0)
	Neutral	1.5 (1.6)	0.8 (1.1)
	Bare	0.1 (0.4)	6.0 (7.9)

### 3.2.2 Anchor tense

As mentioned in Chapter 2, we considered whether an individual child's narrative had an anchor tense only if bare VPs did not exceed 50% of VPs. If this criterion was not met, the child was deemed not to have an anchor tense for that narrative based on the high level of bare VPs for which it was impossible to reliably attribute a tense. This did occur for a minority of children in the SLI group for each story (see Table 3.3).

If the second criterion was met (i.e., most VPs were marked for tense), a narrative was determined to have an anchor tense if  $\geq 75\%$  of the marked VPs (i.e., excluding neutral and bare VPs) were in either the past or the present tense. This was the case for a majority of children in the TD group and many fewer children with SLI, particularly for AF. See Table 3.3 for details.

Fisher's exact tests were conducted to determine if there was a significant association between group and whether or not children had an anchor tense, by story. For AF, TD children were significantly more likely than children with SLI to be consistent in their verb tense usage within a narrative, leading them to have an anchor tense ( $p < .001$ ); this was not the case for FOHO ( $p = .078$ ), although there was a strong trend in that direction. See Table 3.3 for details.

Table 3.3

*Numbers (and percentages) of narratives with and without an anchor tense*

Story	Presence of Anchor	Group		Reason/Type of Anchor	Group	
		TD	SLI		TD	SLI
April Fools	No anchor	1 (4%)	15 (53%)	Bare VPs	0 (0%)	2 (7%)
				Inconsistency	1 (4%)	13 (46%)
	Anchor	27 (96%)	13 (47%)	Past	21 (75%)	10 (36%)
				Present	6 (21%)	3 (11%)
Frog on His Own	No anchor	2 (7%)	8 (29%)	Bare VPs	0 (0%)	2 (7%)
				Inconsistency	2 (7%)	6 (21%)
	Anchor	26 (93%)	20 (71%)	Past	22 (79%)	20 (71%)
				Present	4 (14%)	0 (0%)

Anchor tense data can also be analysed based on whether individual children showed consistency (i.e., same anchor tense or no anchor tense for both stories) or inconsistency between narratives (i.e., different anchor tenses or only one narrative with an anchor tense). Among the TD children, 86% (24 of 28) had a consistent anchor tense (either past or present) for both stories, compared to 32% (9 of 28) of children with SLI. However, 46% (13 of 28) of children with SLI did not have a consistent anchor tense between stories because one of their narratives did not have an anchor tense. See Table 3.4 for details.

Table 3.4

*Numbers (and percentages) of children who told their narratives with or without a consistent anchor tense*

Consistency	Patterns	Group	
		TD	SLI
Consistent	No anchor either	1 (4%)	5 (18%)
	Anchor (past)	20 (71%)	9 (32%)
	Anchor (present)	4 (14%)	0 (0%)
Inconsistent	AF no anchor/FOHO anchor	0 (0%)	10 (36%)
	AF anchor/FOHO no anchor	1 (4%)	3 (11%)
	AF present/FOHO past	2 (7%)	0 (0%)
	AF past/FOHO present	0 (0%)	1 (4%)

A Fisher's exact test indicated that TD children ( $n = 26$ ) were significantly more likely than children with SLI ( $n = 10$ ) to have an anchor tense in both stories ( $p < .001$ ).

### 3.2.3 Tense shifts

When analysing tense shifts, only unambiguously marked (i.e., present or past) VPs were included. Analyses for the rate of tense shifts relative to the total VPs in the story indicated a significant main effect of group ( $F(1, 27) = 18.1, p < .001, \eta_p^2 = .40$ ), no significant main effect of story ( $F(1, 27) = 3.5, p = .07, \eta_p^2 = .12$ ), and no significant group by story interaction ( $F(1, 27) = .39, p = .54, \eta_p^2 = .01$ ). This reflects that, in both stories, TD children ( $M_{AF} = .06, SD_{AF} = .09; M_{FOHO} = .04, SD_{AF} = .06$ ) shifted tenses less often, as a rate of total VPs in the story, than did children with SLI ( $M_{AF} = .18, SD_{AF} = .13, M_{FOHO} = .12; SD_{AF} = .11$ ). Moreover, there was a trend for both groups to shift tenses more often in AF than in FOHO. The particularly high rate of



tense shifting for children with SLI in AF affected their ability to have an anchor tense for that story.

Based on prior research (Berman and Slobin, 1994; Colozzo et al., in preparation; Hickmann, 2003), we considered whether tense shifts occurred in predictable or contextually motivated contexts. The following patterns emerged from the data:

- i. VPs providing a background detail in the context of the story, e.g., 7;4 boy with SLI:

*The dog looked at the butterflies.*

*A frog looked at that boy.*

*The frog looks hungry.*

Instances in which the child pointed something in the story out to the experimenter were also included in this category.

- ii. VPs indicating an event or state that is the result of previously described actions, e.g., 7;7 TD girl:

*His brother looks out of the trees.*

*And he's looking for a way.*

*And they decided to climb up so people can see them because they were lost.*

- iii. VPs that introduce dialogue (i.e., dialogue carriers), e.g., 7;0 TD boy:

*And then we saw it catch a fly.*

*And then we saw it trip.*

*And then it's like "wah".*

- iv. VPs that refer to a previously occurring event in the story, e.g., 7;7 TD girl:

*And then that really fooled everybody so they're the stars of April Fools.*

- v. VPs that occur in response to an experimenter's utterance that may have prompted a particular tense, e.g., 5;11 boy with SLI:

*E Can you tell me what's happening in this picture?*

*C He's jumping to smash his toy.*

As mentioned earlier, data from one participant was excluded due to a high level of experimenter prompting that occurred in a particular tense/aspect. The remaining transcripts were read to determine whether this happened frequently. When prompting was required from experimenters, it was not generally in the same tense and aspect (e.g., present progressive), thus it is unlikely to have affected results. Nonetheless, two children with SLI shifted tenses in their narratives due to a comment or question from the experimenter; each child did so once in AF, and never in FOHO. TD children did not shift tenses for this reason.

- vi. VPs that return the narrative to the anchor tense after a motivated tense shift. This category was only considered for narratives that had an anchor tense. The following example is from a 7;7 TD girl who anchored her stories in the present tense:

*And he sees a woman with her baby.*

*And he hops into the baby carriage.*

*And then she was reading the magazine.*

*And she needs to give it the bottle.*

TD children shifted tenses fewer times in their narratives compared to children with SLI, and when TD children did shift tenses, these shifts were more likely to be interpreted as motivated, according to the patterns listed above. In AF, 24 of 48 (50%) tense shifts produced by the TD group were deemed to be motivated, as opposed to 25 of 164 (15%) tense shifts for the

SLI group. Similarly, in FOHO, 22 of 40 (55%) tense shifts produced by the TD group were motivated, as opposed to 12 of 126 (9.5%) tense shifts for the SLI group.

### 3.3 Aspect

Both TD children ( $M_{AF} = .22$ ,  $SD_{AF} = .19$ ;  $M_{FOHO} = .18$ ,  $SD_{FOHO} = .10$ ) and children with SLI ( $M_{AF} = .26$ ,  $SD_{AF} = .16$ ;  $M_{FOHO} = .19$ ,  $SD_{FOHO} = .11$ ) used a lower proportion of VPs with progressive aspect than simple aspect in both stories, and for both groups and across stories simple aspect clearly dominated. Both groups produced the progressive aspect more often in AF than in FOHO, showing that AF may invite the progressive aspect more than FOHO.

Use of the present progressive is of particular interest because a high proportion of this form can indicate that children are in a descriptive, rather than narrative, mode. Thus, present progressives were analysed as a proportion of all VPs. Analyses regarding the proportion of present progressive VPs indicated a significant main effect of story ( $F(1, 27) = 18.12$ ,  $p < .001$ ,  $\eta_p^2 = .40$ ), but no main effect of group ( $F(1, 27) = .70$ ,  $p = .41$ ,  $\eta_p^2 = .03$ ) and no group by story interaction ( $F(1, 27) = .89$ ,  $p = .35$ ,  $\eta_p^2 = .03$ ). The results reflect that the TD group ( $M_{AF} = .08$ ,  $SD_{AF} = .18$ ;  $M_{FOHO} = .04$ ,  $SD_{FOHO} = .09$ ) and the SLI group ( $M_{AF} = .09$ ,  $SD_{AF} = .11$ ;  $M_{FOHO} = .03$ ,  $SD_{FOHO} = .05$ ) produced similarly low proportions of present progressive VPs. Both groups produced a higher proportion of present progressives in AF than FOHO, which follows the pattern for all progressives noted above.

In AF, only three children (TD,  $n = 2$ ; SLI,  $n = 1$ ) produced more than 30% (42%-85%) present progressive verbs out of their total VPs. In FOHO, only two TD children produced more than 30% (30% and 35%) present progressive VPs. The same two TD children showed this pattern in both stories.

Similar patterns were found regarding distribution patterns of combined bare progressive and present progressive VPs, as a proportion of all VPs. For example, a 7;0 boy with SLI who used several bare forms in his narratives produced the following in AF:

*And they Ø going through the gate.*

*They Ø building something right now because they want to.*

*And they Ø painting it.*

This analysis was performed because children may use bare progressive verbs when attempting to produce present progressive VPs, which would indicate a descriptive mode. Two TD children and two children with SLI produced over 30% (42%-100%) present or bare progressive verbs in AF. In FOHO, no children with SLI showed this pattern and one 6;0 TD boy produced over 45% present and bare progressives; an example from his narrative follows:

*He's walking.*

*Walking again.*

The children mentioned above did show the ability to use auxiliary forms elsewhere in their narratives. It is worth noting that the TD children mentioned above may have been influenced by experimenter prompting in the present progressive (i.e., “What’s happening in this picture?”) in at least in one story.

### **3.3.1 Non-canonical progressives**

As mentioned earlier, VPs with progressive aspect can be more or less grammatically complex. For the purpose of the current analysis, *basic* (or canonical) progressives (e.g., *he was laughing*) were distinguished from *non-canonical* forms, namely compound (e.g., *she has been looking*), complex (e.g., *he tries finding, she stopped looking*), and nonfinite (e.g., *the boy*

*brought a cake with a picture of a girl waving on it*) progressives. Basic progressives were the most common in the sample, as they constituted 71% and 86% of all progressives that TD children and children with SLI produced, respectively.

Table 3.5 presents the mean distributions of progressive VPs by category. Very few compound progressives occurred in this sample (2 tokens from 2 TD children; 3 tokens from 2 children with SLI), so the complex and compound categories were combined. Nineteen TD children and 8 children with SLI produced at least one compound or complex progressive. Twenty-three TD children and 18 children with SLI produced at least one nonfinite progressive. Overall, the majority of children in both groups produced at least one non-canonical progressive in at least one story (TD,  $n = 26$ ; SLI,  $n = 20$ ). Means in Table 3.5 should be interpreted with caution, however, given the high level of individual variability reflected in the large standard deviations.

Table 3.5

*Mean proportions (and SDs) for types of progressive VPs*

Categories of Progressive VPs		AF		FOHO	
		TD	SLI	TD	SLI
Canonical	Basic	.64 (.30)	.87 (.17)	.67 (.26)	.85 (.19)
	Complex/Compound	.26 (.29)	.05 (.11)	.12 (.18)	.02 (.06)
Non-canonical	Nonfinite	.10 (.11)	.08 (.13)	.21 (.21)	.13 (.19)

Analysis of the proportion of non-canonical progressive VPs out of all progressive VPs revealed a significant main effect of group ( $F(1, 27) = 15.6, p = .001, \eta_p^2 = .37$ ), but no main effect of story ( $F(1, 27) = .04, p = .85, \eta_p^2 = .001$ ) and no group by story interaction ( $F(1, 27) =$

.26,  $p = .61$ ,  $\eta_p^2 = .01$ ). These results reflect that TD children produced significantly more non-canonical progressives ( $M_{AF} = .35$ ,  $SD_{AF} = .30$ ;  $M_{FOHO} = .33$ ,  $SD_{FOHO} = .26$ ) than did children with SLI ( $M_{AF} = .13$ ,  $SD_{AF} = .17$ ;  $M_{FOHO} = .15$ ,  $SD_{FOHO} = .19$ ), for each story.

### 3.4 Temporal lexical markers

In English, various lexical markers can convey temporal information; these include aspectual verbs, connectors (i.e., prepositions and conjunctions) that express sequential (e.g., *and then*, *before*) or simultaneous (e.g., *while*) relations, and a variety of other temporal expressions (including nouns, adverbs, and phrases; e.g., *in the morning*, *again*). Although lexical items with a temporal quality are often not necessary for an utterance to be grammatical, they can add interest and cohesion to narratives. The following section will analyse how TD children and children with SLI used lexical items to express temporality in their narratives.

Table 3.6 presents the rate of temporal lexical items produced (excluding formulaic words or phrases, e.g., *once upon a time*) by VP, for each sub-category, by group and by story. The children produced sequencers and all-purpose connectors most frequently, aspectual verbs occasionally, and sequential connectors, simultaneous connectors, and other temporal expressions rarely. These patterns held across groups and stories.

Children in each group produced a wide range of temporal lexical items (ranges: TD, 3-59; SLI, 4-58). All TD children and children with SLI produced at least one temporal lexical item in their combined narratives.

Table 3.6

Mean rates (SDs) of temporal lexical markers per VP, by type

Types of TLIs	April Fools		Frog On His Own	
	TD	SLI	TD	SLI
All-purpose connectors	.26 (.17)	.30 (.18)	.27 (.15)	.32 (.25)
Sequencers	.28 (.19)	.22 (.20)	.27 (.22)	.26 (.23)
Aspectual verbs	.08 (.06)	.08 (.07)	.05 (.04)	.06 (.05)
Sequential connectors	.01 (.03)	.02 (.05)	.00 (.00)	.01 (.05)
Simultaneous connectors	.03 (.04)	.01 (.02)	.02 (.04)	.01 (.03)
Other temporal expressions	.04 (.04)	.02 (.03)	.02 (.02)	.03 (.04)
All Temporal lexical markers	.70 (.25)	.65 (.29)	.63 (.26)	.69 (.29)

### 3.4.1 Aspectual verbs

The following aspectual verbs were produced by the children in the current study: *start*, *get*, *become*, *go*, *come*, *run*, *keep*, *keep on*, *carry on*, *stop*, *be done*, *finish*, *manage*, *be about to*, *going to*. As indicated in Table 3.6, the mean proportion of aspectual verbs per VP varied between .05 to .08 depending on the story and the group. The general tendency was for the TD and the SLI groups to produce similar proportions of VPs with aspectual verbs. Both groups produced a higher proportion of aspectual verbs in AF than in FOHO.

TD children did, however, produce a wider variety of aspectual verbs (i.e., more types) compared to children with SLI. Further, TD children and children with SLI showed preferences for different specific verbs, e.g., 50% of TD children and 14% of children with SLI used the word *start* at least once, while children with SLI mostly used the aspectual verbs *get* and *go*, which accounted for 76% of all their tokens of aspectual verbs, compared to 36% for TD children.

### 3.4.2 Temporal connectors

All TD children and children with SLI produced one or more all-purpose connectors (i.e., *and*) at least once in their combined narratives (ranges: TD, 1-48; SLI, 1-62).

Twenty-seven TD children and 25 children with SLI produced at least one sequencer, e.g., *then*, *and then*, in their combined narratives (ranges: TD, 0-44; SLI, 0-52). Distributions within the groups were similar, with comparable numbers of children in each group producing either very few (9 TD children and 11 children with SLI produced <10) or very many (6 TD children and 7 children with SLI produced >30) sequencers.

Six TD children and 9 children with SLI produced sequential connectors, e.g., *before*, *next*. Most of these children produced one or two of these forms, with one TD child and two children with SLI producing more than this (ranges: TD, 0-8; SLI, 0-17).

Sixteen TD children, and 9 children with SLI produced simultaneous connectors, e.g., *while*, *when*. The variability among TD children who produced these forms was quite evenly distributed across the range (1-13). In contrast, children with SLI who produced simultaneous connectors did so one to three times in their combined narratives, with the exception of one child who produced *when* 13 times. A Fisher's exact test was performed to determine if there was a significant association between group and whether or not children produced at least one simultaneous connector in their combined narratives. Although there was a strong trend for TD children to be more likely than children with SLI to have done so, the result was not statistically significant ( $p = .053$ , one tailed).

To recap, for all types of temporal connectors, rates of use per VP were similar between groups within each story. There was some variability for all-purpose connectors, sequencers, and sequential connectors, but no clear patterns emerged. A trend emerged showing that TD children



produced simultaneous connectors more often than children with SLI, but either group did not produce these forms frequently.

### 3.4.3 Other temporal expressions

Most children in both groups produced at least one lexical item in this category in their combined narratives, e.g., *quite a while*, *already*, *suddenly* (TD,  $n = 22$ ; SLI,  $n = 21$ ). TD children produced a range of 0 to 11 of these forms, and children with SLI produced 0 to 8. The most common temporal expressions produced by TD children were *again* ( $n = 11$ ), *still* ( $n = 11$ ), *around* ( $n = 7$ ), and *finally* ( $n = 7$ ); for children with SLI, they were *again* ( $n = 15$ ), *still* ( $n = 7$ ), and *along* ( $n = 4$ ). See Appendix C for a complete list.

### 3.4.4 More advanced temporal lexical items

More advanced temporal lexical items—aspectual verbs, sequential connectors, simultaneous connectors, and other temporal expressions—were combined to create a composite variable due to their infrequent occurrences and similar distribution patterns between groups. Analysis of these combined forms revealed a significant main effect of story ( $F(1, 27) = 8.08$ ,  $p = .008$ ,  $\eta_p^2 = .23$ ), but no main effect of group ( $F(1, 27) = .35$ ,  $p = .56$ ,  $\eta_p^2 = .01$ ) and no group by story interaction ( $F(1, 27) = 2.33$ ,  $p = .14$ ,  $\eta_p^2 = .08$ ). These results reflect that TD children and children with SLI did not differ in their productions of more advanced temporal lexical items, but both groups were more likely to produce these temporal lexical items in AF ( $M_{TD} = .16$ ,  $SD_{TD} = .08$ ;  $M_{SLI} = .12$ ,  $SD_{SLI} = .10$ ) than in FOHO ( $M_{TD} = .09$ ,  $SD_{TD} = .07$ ;  $M_{SLI} = .11$ ,  $SD_{SLI} = .08$ ).

## 3.5 Repetition

VPs can be repeated to express duration (e.g. *the dog was barking and barking; they walked and walked*). TD children used repetition to express this meaning less often than did children with SLI; further, only 2 TD children, both in the youngest age group (Kindergarten),

used repetition in their stories, compared to 8 children with SLI across age groups (Kindergarten,  $n = 2$ ; Grade 1,  $n = 2$ ; Grade 2,  $n = 4$ ). TD children used repetition on 3 occasions, whereas children with SLI used repetition on 12 occasions.

## Chapter 4: Discussion

In this section, results are discussed and interpreted with reference to the existing literature, and group results are augmented by individual-level data. The data sets produced by 5- to 8-year-old TD children and children with SLI alike included many VPs (*Ms* of 33 or more per story) and words (*Ms* of 200 or more per story), providing ample opportunities for participants to express temporal meanings using grammatical and lexical markers. The research questions for this study, as discussed in Chapter 1, were as follows:

- i. Do 5- to 8-year-old children with SLI mark tense in obligatory contexts less often than TD peers when producing narratives?
- ii. Do 5- to 8-year-old children with SLI use a consistent verb tense (i.e., anchor tense) throughout their narratives less often than TD peers when producing narratives?
- iii. Do 5- to 8-year-old children with SLI perform more similarly to TD peers in their production of temporal lexical markers, as compared to their use of grammatical temporal markers when producing narratives?

### 4.1 Grammatical results

Results regarding tense and aspect represent grammatical abilities, because tense and aspect are marked morpho-syntactically. These findings indicate that more children with SLI than TD children had difficulty marking tense on verbs. However, children with SLI and TD children similarly preferred to use the past tense in their narratives over the present tense. Both groups of children also showed a preference for telling stories in simple (i.e., non-progressive) aspect. Children with SLI produced similar proportions of VPs with progressive aspect as did TD peers, though they produced fewer non-canonical (i.e., grammatically complex) forms with progressive aspect. These results will be discussed in detail in the subsections below.

#### 4.1.1 Tense

Results regarding tense showed that more children with SLI produced bare forms, (i.e., unmarked verbs in obligatory contexts), than TD children, which is in line with existing evidence that English-speaking children with SLI exhibit difficulties with tense marking generally (Leonard, 2014; Rice & Wexler, 1996) and in narratives (Norbury and Bishop, 2003). This result also supports the first research question. Not only did many fewer TD children than children with SLI produced bare forms, but the few TD children who did use bare forms tended to do so less often than children with SLI. Thus, failure to mark tense in obligatory contexts was a prevalent pattern for several children with SLI, and difficulties in marking tense are evident in many of these children's narratives.

The high proportions (approximately one-sixth) of bare VPs in the narratives of children with SLI may have resulted in the proportions of past tense VPs being lower than for TD children, although both groups clearly showed a preference for using the past tense over the present tense. When considering only VPs that were marked for tense, both groups used the past tense for at least two-thirds of marked VPs in each narrative, on average, for each story. The past tense serves as a deictic reference point in narratives; this adds complexity to narratives, as narrators are required to refer to events in relation to past time, e.g., *he saw the frog he had lost*, or *he saw the frog he lost earlier*, as opposed to referring to them in relation to the present moment, e.g., *he sees the frog he lost* (Bates et al., 1994; Smith, 2009). As shown in the examples above, when narratives are anchored in the past tense, perfect tenses or temporal lexical items (e.g., *earlier*) may be necessary more often.

The current results align with existing studies, which have found that groups of English-speaking TD children in the early elementary school years generally favour the past tense in their

narratives (Berman & Slobin, 1994; Colozzo et al., in preparation; Hicks, 1990; Shapiro & Hudson, 1991). The fact that children with SLI also favoured the past tense suggests that their understanding of the expectations of a narrative genre may be a strength, although their execution of appropriately marking VPs seems to remain a difficulty. This is evident with respect to the frequency of bare VPs, as discussed above (e.g., *she \*stand; he \*go*), and of overgeneralization errors when participants were attempting to produce the past tense (e.g., *they standed; he goed*). Overgeneralization errors are interesting to examine, because they have a clear past tense marking, indicating that the child's intention was likely to produce the VP in the past tense, but the child did not do so appropriately. TD children are generally able to conjugate irregular verbs in the past tense by age 3-3.5 years (Chapman, 2000), explaining the low incidence of overgeneralization errors used by 5- to 8-year-old TD children. Predictably, children with SLI showed delays in their grammatical development in this study, which manifested in several ways, including a higher proportion of both bare forms and overgeneralization errors in their narratives.

The frequency with which children shifted tenses within a narrative directly influenced their use of an anchor tense. Children with SLI shifted tenses within their narratives more often than TD children; this is reflected in the larger number of children with SLI who did not have an anchor tense because less than 75% of the marked VPs in the main narrative were in a consistent tense. Both groups of children shifted tenses more often in AF than in FOHO. The vast majority of TD children shifted infrequently enough that this did not prevent them from having an anchor tense in either story. In contrast, the greater rate of shifting in AF led several children with SLI to lack an anchor tense in AF, but have an anchor tense in FOHO. Story differences or task order could be at play here (see Section 4.5, below).

Children with SLI tended to shift tenses throughout their narratives; most children with SLI shifted more than 10 times per story. This contrasts with patterns from some TD children who lacked an anchor tense, but did not shift tenses very often, because they told their narratives in two or more blocks of present or past tense with little shifting occurring within each of these blocks. This pattern has been noted for TD English-speaking (Colozzo et al., in preparation) and German-speaking (Bamberg, 1987) children in this age range. Many TD children never shifted tenses within their narratives (16 children in AF; 15 children in FOHO), which was a relatively uncommon pattern for children with SLI (7 children in AF; 8 children in FOHO).

The TD children's infrequent tense shifts could be seen as motivated, which aligns with prior studies by Colozzo and colleagues (in preparation) and Hickmann (2003). Children with SLI more often shifted tenses in ways that seemed unmotivated, suggesting that these tense shifts may have been more haphazard in nature. Prior research has found that more erratic tense shifts tend to occur at earlier stages of narrative development and that shifting tenses for contextually motivated reasons is a skill employed by more sophisticated narrators (Bamberg, 1987). Thus, a comparatively higher proportion of seemingly random tense shifts by children with SLI may indicate less advanced narrative abilities in this respect compared to age-matched TD peers. Given that many children with SLI have difficulty marking tense appropriately on verbs, it seems to naturally follow that they would likely have difficulty using tense shifts between VPs to make meaningful distinctions in their narratives. This was exemplified in the current data. A higher level of mastery of a tense system may be required to make motivated tense shifts within an anchored narrative, as indicated by data from German-speaking children and adults (Bamberg, 1987).

When children with SLI did use a consistent anchor tense in their narratives, it was most often the past tense. This is in accordance with the studies of English-speaking TD children at this age reviewed in Chapter 1 (Berman & Slobin, 1994; Colozzo et al., in preparation; Handford, 1996). This is the first study to investigate the preferred anchor tense of children with SLI at this age; the fact that they show a preference for the past tense, as TD children do, indicates that some features of their content knowledge (e.g., knowledge of how a story should be told) may be developing similarly to that of TD peers, while their grammatical development remains delayed.

Most TD children were consistent in their use of an anchor tense between stories; that is, if a child told the first story in the past tense, he or she was also likely to tell the second story in the past tense. This pattern was much less evident for children with SLI, but these results are confounded by the fact that children with SLI often lacked an anchor tense in one or both of their stories. The results from TD children suggest that telling a narrative in a certain tense may reflect a preference for an anchor tense that is stable across stimuli, at least when telling narratives from wordless picture books.

To recap, children with SLI used an anchor tense in both their narratives less often than did TD peers; this is attributable to their difficulties marking tense in obligatory contexts, as well as the high frequency of tense shifts within a narrative. Children with SLI were also found to shift tenses for seemingly unmotivated reasons, whereas their TD peers generally shifted following predictable patterns. When children in both groups used an anchor tense, the past tense was preferred, potentially showing a level of sophistication in knowledge of the story genre.

#### 4.1.2 Aspect

Both TD children and children with SLI predominantly used simple aspect in their narratives; this aligns with distributional data from Berman and Slobin (1994) and Hickmann (2003). Few children in either group showed the opposite pattern of preferring progressive aspect to simple aspect (2 children from each group for AF; no children from either group for FOHO).

Using the simple past (rather than the present progressive) is generally indicative of a narrative mode of storytelling (Berman & Slobin, 1994). The preference of both groups for using past tense and simple aspect suggests that these children were at a stage in their narrative development beyond the picture description mode, which Berman and Slobin (1994) described as the first stage of narrative production. Both groups of children produced proportionately more VPs in the present progressive in AF than in FOHO. This may be due to properties of AF (see Section 4.4). Very few children in each group showed a strong preference for using the present progressive in their narratives, indicating that the trends observed at the group level reflected patterns observed at the individual level.

There are various ways to use the progressive aspect in English, which differ in complexity. *Basic* (or canonical) *progressives* include an auxiliary verb and a progressive, or a semimodal verb and an infinitive (e.g., *he was laughing*; *she is going to run*). These least complex forms were the most common in the sample, for both groups of children. Nevertheless, more than two-thirds of children in each group produced at least one non-canonical progressive in at least one story.

*Compound progressives* include a perfect tense followed by a progressive (e.g., *they have been looking*, *she had been thinking*), or a modal followed by an auxiliary verb and a progressive (e.g., *he will be running*). Compound progressives occurred very infrequently in the sample (TD,



2 tokens; SLI, 3 tokens). It is worth noting that the children with SLI who produced these forms did not do so in an entirely grammatical way. For example, a 6;5 boy with SLI substituted the auxiliary *be* for the auxiliary *have* in the following C-unit:

*And the \*peoples \*were been looking at the ocean and looked up.*

A different 6;5 boy with SLI attempted to produce compound progressives on 2 occasions:

*They looked like they  $\emptyset$  been making a slide; and*

*They  $\emptyset$  been trying to make a dragon.*

In both of these cases, this child omitted the auxiliary *have*, showing incomplete mastery of this form.

In contrast, the TD children who produced these forms did so grammatically, e.g., a TD 7;8 girl said the following:

*So his older sister who had been reading the book came out and picked up the boat;*

*And the other frog actually had been a turtle.*

A TD boy, aged 7;3, produced a compound progressive that was grammatically correct within the C-unit, but it did not align with the tense of the preceding C-unit (Bamberg, 1987):

*And they climbed up.*

*And after that they've been looking in the woods.*

Although there are too few occurrences of compound progressive forms to make inferences from this data, the predictable pattern was found.

Recall that *complex progressives* are composed of a lexical verb, followed by a verb in the progressive form (e.g., *he tries finding; she starts running; they stopped looking*). All lexical verbs that appeared in the sample were aspectual verbs, except for *try*. More TD children used complex progressives more frequently than children with SLI, and more TD children than

children with SLI used at least one complex progressive in their combined narratives. Complex progressives are lexically and morpho-syntactically more complex than basic progressives, since they combine two lexical meanings, with the appropriate markings, within one VP.

*Nonfinite progressives* are untensed and are part of a subjectless clause, e.g., *He likes the painting with the girl waving in it* (Huddleston & Pullum, 2005, p. 206). Although similar numbers of TD children and children with SLI produced at least one nonfinite progressive in their narratives, nonfinite progressives were produced more frequently in narratives of TD children compared to children with SLI. Nonfinite progressives are particularly interesting, because these forms can often be used to express relations of simultaneity (e.g., Aksu-Koç & von Stutterheim, 1994; Colozzo et al., in preparation; Hickmann, 2003).

Statistical analyses indicated that TD children produced more non-canonical (i.e., more complex) progressives (compound, complex, and nonfinite combined) than did children with SLI. This is an expected finding, as more grammatical complexity is often associated with these forms, which is a known area of difficulty for children with SLI.

#### **4.1.3 Summary of grammatical findings**

To recap, the majority of TD children always marked tense on VPs in obligatory contexts in their narratives, whereas the majority of children with SLI did not mark tense on at least one occasion in each of their narratives. Both groups of children tended to use the past tense and simple aspect more often than present tense and progressive aspect, suggesting that most children in both groups were in a true narrative mode of storytelling, as opposed to a descriptive mode, as would be expected in the age range studied (Berman & Slobin, 1994). TD children used an anchor tense in their narratives more often than children with SLI, and shifted tenses in their narratives less often than children with SLI; these results are related because a high level of tense

shifting often leads children to lack an anchor tense. TD children used more non-canonical progressives than children with SLI, suggesting that children with SLI do not attempt to produce progressive forms with a more complex grammatical structure as often as TD children do. Taken together, these results indicate that children with SLI show a delay in their development of morpho-syntactic forms to express temporality in narratives between the ages of 5 and 8 years; this supports prior research indicating that many children with SLI exhibit difficulties with morphosyntactic and grammatical development (Leonard, 2014).

## **4.2 Lexical results**

This section summarizes and interprets results regarding lexical markers of temporality are included herein. These results show similar patterns of usage between TD children and children with SLI, but with great individual variability.

### **4.2.1 Temporal connectors**

When *and* coordinates VPs within a C-unit or appears at the beginning of a C-unit, it is generally ambiguous whether situations are sequential or simultaneous. To illustrate, *The boy was laughing and walking* is likely to be interpreted as the boy laughing and walking at the same time, whereas *The man paid his bill and left the restaurant* is likely to be interpreted as two sequential actions. Most TD children and children with SLI used all-purpose connectors frequently in their narratives; *and* appeared on average in one-quarter to one-third of clauses and represented approximately half of the connectors produced. This aligns with data from Hickmann (2003) and Colozzo and colleagues (in preparation) for English-speaking TD children in this age range. In the present study, all children produced *and* at least once in their combined narratives. The prevalence of *and* is clear from the data, and its patterns of use did not seem to differ between groups.

Sequencers and sequential temporal connectors advance the plot forward in time and are most often used to express the default temporal relationship of forward sequentiality (Aksu-Koç & von Stutterheim, 1994). Hickmann (2003) found that younger TD children (i.e., 4-5 and 7-year-olds) used temporal lexical items that expressed sequential relationships more often than older TD children (i.e., 10-year-olds) and adults; this finding was evident cross-linguistically. In the current study, similar numbers of children with SLI and TD children used sequencers and sequential connectors in their stories. Further, both groups showed similar distributions for each of these categories. Sequencers (*and then, then*) were used often by both groups and by most children; they appeared on average in one-quarter of clauses and represented just under half of the connectors produced. In contrast, sequential connectors (e.g., *after, before, next*) were used much less frequently, representing approximately 2% of the connectors produced. The few children who produced any sequential temporal connectors (approximately one-third in each group) often only produced one or two in their combined narratives. Overall, the two groups of children seemed to be performing similarly regarding temporal lexical items that advance the plot forward in time, with less specific sequencers occurring more often than more specific sequential temporal connectors.

Linking situations in narratives with words such as *meanwhile, while, and when* allows storytellers to express simultaneous or overlapping relationships and thus add background information to the narrative (Aksu-Koç & von Stutterheim, 1994). For instance, a 6;2 TD girl produced the following: *Then while the other people climbed up to see what was going on the roof, they ran away.* Previous research by Hickmann (2003) found that simultaneous temporal connectors were used more frequently by adults and children above age 10 compared to younger children. Furthermore, both Hickmann (2003) and Colozzo et al. (in preparation) reported that

the use of simultaneous temporal connectors by English-speaking children was stable in the early elementary school years—between the ages of 4-5 and 8 years. The current data shows that TD children and children with SLI performed similarly in their productions of simultaneous temporal connectors; both groups produced these forms infrequently, as they represented approximately 3% of connectors and there was much individual variability. However, it was more common for TD children than children with SLI (16 compared to 9 children, respectively) to produce at least one simultaneous connector, and most TD children produced more than three in their combined narratives. There was, however, one notable exception. One child with SLI produced *when* 13 times in his combined narratives, which is the most common simultaneous temporal lexical item in the sample.

It is also noteworthy that the only child with SLI who produced more than 50% bare VPs in each narrative, a 7;0 boy, used two simultaneous temporal lexical items in FOHO, and in both C-units the verb was unmarked for tense:

*He \*go in the baby basket while he's not paying attention.*

*The mother \*give the frog milk when he's not looking.*

This child used very few temporal lexical items (i.e., only four in total, including these two examples), but two of these are generally considered to be more advanced forms. One thus gets a different impression of this child's abilities depending on whether frequency or diversity/complexity are considered as indicators of his ability to express temporality via lexical markers. Based on the presence of two different simultaneous connectors and the high proportion of bare VPs, he presents an asynchronous profile between grammatical and lexical abilities.

Analyses for separate grades were not completed due to insufficient numbers of children in each grade. However, it is interesting to note that, among kindergartners, 6 TD children

produced at least one simultaneous connector, compared to only 1 child with SLI. The numbers were more similar for the two higher grades with 10 TD children and 8 children with SLI producing at least one simultaneous connector. This may suggest a more even profile over the early elementary school grades for TD children than children with SLI. Perhaps the skill of using simultaneous connectors more often develops to a level of flexible usage (as evidenced by more frequent productions of these forms) earlier for TD children than children with SLI. Further research with larger samples, a wider age range, and/or other elicitation tasks could focus in more depth on this subcategory of connectors.

#### **4.2.2 Other lexical features**

TD children and children with SLI produced similar proportions of aspectual verbs in their narratives, although the distributions differed between the groups. TD children produced a broader variety of aspectual verbs than children with SLI (i.e., TD children produced *become*, *carry on*, *manage*, *come*, and *run* as aspectual verbs, and children with SLI did not). Most instances of aspectual verbs produced by children with SLI were *go* and *get*. Most children in both groups produced at least one aspectual verb in their combined narratives (26 children in each group); of these children, most produced more than one different aspectual verb. Thus, the majority of children in both groups did not repeat the same aspectual verb several times within their narratives, showing some diversity of forms. However, TD children tended to produce more diverse forms than children with SLI, indicating that there may be lexical differences between TD children and children with SLI. These differences are not as robust as differences in grammatical development.

There is no direct correspondence between the meaning categories described by Berman and Slobin (1994) and the grammatical complements that certain aspectual verbs can take. Some

aspectual verbs, such as *get* (e.g., *He got scared; She got lost*) and *become* (e.g., *They became famous*) are followed by a predicate with an adjectival meaning, and may thus be grammatically less challenging. Other aspectual verbs can take either an infinitival or a progressive complement (e.g., *They went running; They went to see; They start building; They start to build*), which in the latter case result in complex progressive VPs. More verbs still can take either an infinitival (e.g., *They run to see*) or a progressive (e.g., *They stopped building*) complement. Thus the semantic and syntactic properties of VPs with aspectual verbs should be kept in mind when considering the data from children with SLI.

It is interesting to consider data from the three children who lacked an anchor tense due to producing too many bare VPs in one or both narratives. These children produced 1, 9, and 12 aspectual verbs in their narratives; interestingly, all but one of these 22 verbs was either *go* or *get*, the aspectual verbs that were most commonly used by children with SLI.

Duration can be expressed via aspectual verbs (e.g., *he kept on walking*) or repetition of VPs (e.g., *he was walking and walking*). Neither group used repetition very often to express this meaning, but fewer TD children than children with SLI did so. Given that aspectual verbs sometimes result in complex progressives, coordinating VPs with a simple conjunction (*and*) may be a grammatically simpler solution. Because children with SLI struggle to add morphological markers to verbs (Leonard, 2014), it can be expected that they may fail to mark tense and aspectual relations on occasion, or mark these relations in less complex ways compared to TD children.

Similar numbers of TD children and children with SLI produced temporal expressions that serve a variety of functions related to time, including adverbs and phrases with a temporal quality (e.g., *later, suddenly, all the time*; see Appendix C for a complete list). TD children and

children with SLI produced similar frequencies based on types (i.e., different lexical items, indicating diversity) and tokens (i.e., number of lexical items, indicating productivity). Neither group produced very many, however, as they appeared on average only once in every 30 clauses. Most children produced a particular form one or two times, if at all; this shows that children who produced several tokens of temporal lexical items tended to show some diversity in the types of temporal expressions they used. Finally, it was interesting that similar (and some of the same) lexical items in this category (e.g., *again*, *still*) were preferred by both groups of children.

#### **4.2.3 Summary of lexical results**

TD children and children with SLI generally performed similarly in their production of temporal lexical items, indicating that this method of marking temporality in narratives is a relative strength for them. Aspectual verbs, sequential connectors, simultaneous connectors, and other temporal expressions were produced less frequently and are assumed to be more advanced than the early-appearing *and*, *and then*, or *then*. We thus combined them to create a composite variable. TD children and children with SLI produced similar proportions of these forms, and both groups were more likely to produce these types of lexical items in AF than in FOHO. Children with SLI may thus show a relative strength for using both frequent and infrequent categories of temporal lexical items.

Specific findings regarding the distribution of subtypes of temporal lexical items produced (e.g., simultaneous connectors, all-purpose connectors) align with data from Colozzo and colleagues (in preparation) and Hickmann (2003) for English-speaking TD children in this age range. This study suggests that children with SLI may show differences in the diversity of some forms (e.g., aspectual verbs, simultaneous connectors), but no statistically significant differences between groups were found. This could have to do with the size of the sample, the



low frequencies with which some of these forms were produced, and the specific narrative tasks employed. Future research could explore this further. Prior research has indicated that preschoolers with SLI exhibited a relative lexical, as compared to grammatical, strength (Moore & Johnston, 1993) when expressing temporal relations. The current data suggest that this pattern continues into the early elementary school years.

### **4.3 Practice/story effects**

Although the two stories were chosen to be of similar difficulty, a few story differences emerged. Both groups produced proportionately more present progressive VPs and advanced temporal lexical items in AF compared to FOHO. Most notably, many fewer children with SLI had an anchor tense in AF ( $n = 13$ ) compared to FOHO ( $n = 20$ ).

There may be characteristics of AF that make it a more demanding story from which to produce a narrative compared to FOHO. The narratives produced from each story have previously been compared in terms of how successfully children clearly refer to characters (i.e., reference); Colozzo and Whitely (2014) and Frick (2012) found that AF was more difficult in this respect than FOHO, for TD children and children with SLI alike. Although no story differences with respect to temporality were identified for a larger sample of TD children aged 5-8 years (Colozzo, et al., in preparation), there could be other story differences that specifically affect children with SLI. For instance, AF resulted in somewhat higher MLU in words and morphemes for both groups and, as mentioned above, that story seemed to invite more advanced temporal lexical items. A macrostructure analysis of both stories could help to identify other story differences that may have been overlooked, but could place greater demands on storytellers with weaker language abilities.

Children in this study were not provided with a model story from which to structure their own story, or any specific feedback regarding their performance. Yet, it is possible that practice effects influenced the results obtained, since children with SLI performed more similarly to TD peers regarding anchor tense in the second narrative task, FOHO. If practice effects did play a role, it is clinically relevant that children with SLI could improve their performance on a subsequent narrative production task by simply having an extra opportunity to tell another story from a wordless picture book within a short period of time (i.e., only a few minutes elapsed between children telling the first and second story).

## Chapter 5: Conclusion

The first research hypothesis, which posited that children with SLI would less frequently mark tense in obligatory contexts than TD peers, was supported by the data. This aligns with prior research concerning the difficulties children with SLI have regarding marking tense appropriately on verbs (Leonard, 2014; Norbury & Bishop, 2003; Tager-Flusberg & Cooper, 1999).

The second hypothesis, which suggested that children with SLI would less frequently use a consistent verb tense throughout their narratives than TD peers, was also supported by the data. Most TD children had an anchor tense in both their narratives ( $n = 26$ ), whereas this was the case for a minority of children with SLI ( $n = 10$ ). This is mostly attributable to the high frequency of tense shifting for seemingly unmotivated reasons that occurred in children with SLI's narratives, which were relatively minimal in TD children's narratives. Interestingly, when both groups of children used an anchor tense, it tended to be the past tense. Moreover, simple aspect dominated and present progressive forms, which are associated to a picture description mode, were rare (Berman & Slobin, 1994; Colozzo et al., in preparation). The preference of both groups of children for usage of the simple past tense suggests that children in both groups were likely to be viewing the story generation task as a true narrative task. Of the progressive forms that children produced, TD children were found to produce a higher proportion of non-canonical (i.e., more grammatically complex) progressive VPs compared to children with SLI. This may reflect some of the grammatical difficulties exhibited by children with SLI.

The third and final hypothesis posited that children with SLI would show strength in their use of temporal lexical items over temporal grammatical markers. The overall picture supports this hypothesis, as group differences emerged with respect to some grammatical variables but

none of the lexical variables. Specifically, TD children were less likely to produce bare (i.e., unmarked but not grammatical) VPs, shifted tenses less often and were more likely to do so for motivated reasons, were more likely to have an anchor tense in both stories, and produced a higher frequency of non-canonical (i.e., more complex) progressives. In contrast, the groups showed similar patterns of use of temporal lexical items, including forms that are less advanced (i.e., all-purpose connectors and sequencers) and more advanced (e.g., aspectual verbs, sequential connectors, simultaneous connectors, and other temporal markers). The findings presented herein are in link with those of Moore and Johnston (1993) for younger children and their claim that children with SLI exhibit asynchronous development in grammatical and lexical domains. The present data suggest that this trend continues into the early elementary school years, at least when children complete a demanding task of generating a narrative from a wordless picture book. It should be noted that a lexical strength indicates that children in both groups are performing similarly to one another, not that children with SLI are more proficient than TD peers.

The current data did not reveal patterns regarding children who lack tense on VPs as using more temporal lexical items, as might have been expected based on the results of Krantz and Leonard (2007). The children who produced the most unmarked VPs in their narratives did not produce relatively more temporal lexical markers. Thus, the finding by Krantz and Leonard (2007) may not extend to narrative productions. It should be noted, however, that every C-unit was not systematically analysed to see whether a temporal lexical items was likely to occur with a bare VP.

Data from children with SLI who produced so many bare VPs (i.e., more than 50% of VPs) that they were considered to lack an anchor tense were examined further. Two of the four

narratives (told by the same child) had very few temporal lexical markers, and one had more than any other narrative in the sample. The remaining narrative had an average number of temporal markers, but these lacked diversity; 19 of the 21 lexical items were instances of the all-purpose connector *and*. The child who produced very few temporal lexical items is noteworthy, because he expressed some more advanced temporal relations by using lexical items that express simultaneity in FOHO (see Section 4.4.2.1 for more details).

To summarize, children with SLI and TD children between 5 and 8 years of age showed more similar skills in their lexical development than in their grammatical development with respect to expressing temporality in their narratives, indicating that children with SLI in this age range continue to show a lexical over grammatical advantage (Moore & Johnston, 1993).

## **5.1 Clinical relevance**

Narratives are frequently used both as an assessment and an intervention context for children in the early school years. This study offers some insights that may have bearing on both types of activities.

Differences in performance between stories are clinically important, whether they are due to story differences and/or practice effects. These differences suggest that it may be important to use more than one story elicitation to obtain a more accurate impression of a child's storytelling abilities, as was evident here with respect to anchor tense. Demonstrating their abilities seems to be a dynamic process for children with SLI, and they seem more sensitive than TD peers to factors such as the specific story, and/or whether they have done a similar task previously.

As mentioned in Chapter 1, the age span of 5 to 8 years is an important time in children's education. Over these years, children are expected to progress from decoding text to gleaning knowledge from written paragraphs and complex spoken language, reflecting upon the meanings

of this material, and producing written works and oral presentations. Children with SLI face additional challenges throughout these years, as their academic success becomes increasingly dependent on their language abilities. For example, while children in Kindergarten may be asked to perform simple mathematical problems with visual supports and little to no written text, children in Grade 2 may be asked to solve mathematical problems by paying attention to the relevant sentences in a paragraph and deciphering their meanings, then performing the appropriate calculation. Children are increasingly challenged by the tasks that are imposed on them as the curriculum advances over time, and interpreting and producing lengthy written works requires more cognitive resources than tasks they had previously been asked to perform.

The knowledge that children with SLI have a greater ability to use lexical markers as opposed to grammatical markers to express temporality during this age range may have implications for their education. Since this finding was obtained in the naturalistic and cognitively demanding context of narrative production, this lexical advantage is likely to be evident in other cognitively demanding tasks, such as tasks that children are asked to perform at school. Interventionists could adapt teaching strategies in order to bootstrap grammatical learning onto a child's existing lexical knowledge and take advantage of redundant information. For example, grammatical structures could be taught and practiced by combining temporal lexical items and grammatical markers or more grammatically complex structures. Similarly, using specific lexical items in stories that these children hear may help them to understand grammatical relations as they are expressed. As another example, SLPs could use temporal lexical items to reinforce the meanings of grammatical forms as they teach children with SLI to produce these forms. In a session targeting the production of present and/or past tense verb markings, when the child produces an unmarked form, e.g., *he \*throw the ball*, the SLP could

use temporal lexical items to verify the meaning, e.g., *he threw the ball already, or he throws the ball now?* From this point, the child might respond *he \*throw the ball already*, allowing the SLP to verify that the child intended to produce the past tense. The SLP could then draw attention to the word *threw* when repeating the sentence again, and ask the child to try saying it.

## **5.2 Limitations**

Limitations must be taken into account when interpreting data presented in this study. It is important to consider that the children with SLI in our sample have been receiving SLP treatment, but data is unavailable concerning the duration, intensity, and focus of their treatment. Eleven of the 28 children with SLI had composite language scores on the TOLD-P:4 that were less than -1 *SD* from the mean, although they scored at or below this cut-off on at least two subtests. Only five of the 28 children in the sample scored below -2 *SDs* from the mean on the composite language score. Although performance on the TOLD-P:4 could reflect lack of sensitivity of the test, it may also indicate that the level of language impairment of the participants was relatively mild. These results may be less applicable to children who have received no SLP services to date, and children with more severe language impairments.

Narratives were obtained from wordless picture books. This is a structured task in which children are given time to review the pictures in a book before they are expected to formulate a narrative as they look at the book again. This task may not be as difficult as other narrative tasks, such as telling a personal narrative without picture support, or telling a narrative from a picture depicting a single scene (Colozzo et al., 2015). This is because wordless picture books outline the episodic structure of the narrative, meaning that narrators have visual supports to help them organize their narratives. It is not possible to know to what extent this may have influenced the results presented here, and in particular may have resulted in similarities between groups for the

lexical markers. Future research could further explore task effects on narrative production, including temporality.

This study did not counterbalance the order in which children told stories; thus it is not possible to know the extent to which differences between stories reflect practice effects and/or story differences.

### **5.3 Future directions**

Future research could explore several avenues based on the findings of this study. Future studies might study older children with SLI, compared to their peers, to see whether children with SLI continue along the same trajectory in their narrative productions, or whether their narrative skills plateau or develop more quickly, as compared to TD peers. This could help to examine the types of long-term outcomes that might be expected for children with SLI's academic development.

Future research could use a larger sample size to look in more depth at the types of temporal lexical items that children with SLI, as compared to TD children, produce in their narratives. This may help to find whether these groups of children differ in the types of more advanced relations (e.g., simultaneous or sequential) that they express.

Future studies could have a similar focus as the current study, but counterbalance the stories, and/or use stories that are matched for difficulty at a macrostructural level. It could also be interesting to consider the impact of different elicitation contexts.

Another avenue for future research could involve intervention studies that evaluate the effects of adapting teaching strategies in order to use children's lexical knowledge to support grammatical abilities.



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## Appendices

### Appendix A: Participant standard scores on the TOLD-P-4 subtests

*Participant standard scores on the TOLD-P-4 subtests*

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Participant Number	Subtest Scores					
	PV	RV	OV	SU	SI	MC
1501	6	7	1	8	6	3
1503	6	2	1	10	5	5
1505	9	8	6	7	5	8
1507	15	3	5	11	5	10
1508	10	4	7	9	5	8
1509	13	8	7	11	7	11
1510	7	3	6	5	4	7
1511	10	2	5	11	9	11
1512	8	7	5	8	6	6
1513	13	5	6	12	10	10
1602	10	7	4	8	7	7
1603	13	11	4	13	13	3
1604	9	3	6	7	1	4
1605	11	9	8	7	5	10
1606	11	4	7	11	4	9
1607	9	6	5	8	10	9
1608	8	4	6	7	5	5
1609	10	7	7	10	6	10
1611	10	4	4	7	5	6
1613	10	3	4	8	3	8
1701	14	10	7	8	5	9
1702	13	7	7	8	6	8

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Participant Number	Subtest Scores					
	PV	RV	OV	SU	SI	MC
1703	12	4	6	10	7	7
1704	10	8	6	9	5	9
1705	8	8	7	13	7	8
1709	10	4	3	7	7	3
1710	8	5	3	8	3	4
1711	6	5	7	13	5	7

*Note.* TOLD-P:4, Test of Language Development Primary, 4th Edition. Subtests,  $M = 10$ ,  $SD = 3$ . PV = Picture Vocabulary; OV = Oral Vocabulary; SU = Syntactic Understanding; SI = Sentence Imitation; MC = Morphological Completion.

## **Appendix B: Detailed coding decisions for tense and aspect**

Coding decisions were mainly informed by the following sources: Bamberg (1987), Comrie (1976), Declerck (2006), and Huddleston and Pullum (2005). All VPs in the main narratives (excluding dialogue) were coded for grammatical tense and grammatical aspect. *Complex VPs* consisting of verb chains (tensed verb + infinitive or participle) were not decomposed (e.g., *He wants to eat; One of the boys tried looking for a way out*). Conversely, participles in freestanding nonfinite (i.e., untensed) clauses were coded as separate VPs (e.g., *It saw a bee buzzing by*).

### **.1 Tense**

Each VP was coded according to a present or past dichotomy, with coding decisions guided by considerations regarding concordance of tenses. Finite VPs are those on which tense is marked (on the main verb or an auxiliary); nonfinite VPs are not marked for tense. There were

too few cases of perfect tense forms to treat them separately.

1) Present:

- a) Finite VPs with present tense: (i) main verbs (e.g., *The frog jumps; they build*); (ii) *be*, *do*, or *have* auxiliary forms (e.g., *The baby is crying; And they don't know what's happening; They have been looking in the woods); or, (iii) present forms of modals/semi-modals: *must*, *can*, *will*, *may*, *shall*, *going to*, *have to*, and *gonna* (e.g., *We can scare someone from up here; The boys are going to build something*).*
- b) Finite complex VPs with verb chains that were complements of present tense verbs (e.g., *He wants to eat; They start painting it; The cat is trying to catch the frog*).

2) Past:

- a) Finite VPs with: (i) regular and irregular past tense main verbs (e.g., *The frog jumped; The boy ran*); (ii) past tense *be*, *do*, or *have* auxiliary forms (e.g., *The little boy was sailing his toy boat; They both didn't agree which way they would go; It had stung him on the tongue*); (iii), preterite forms of modals: *could*, *would*, *might*, *should* (e.g., *Everybody could see it*); or, (iv) past forms of semi-modals *going to*, *have to*, *be about to*, and *gonna* (e.g., *She was about to jump*).
- b) Finite complex VPs with verb chains that were complements of past tense verbs (e.g., *They started to bring the dragon out in the car; One of the boys tried looking for a way out; They were trying to get in there*).

3) Unmarked for tense:

- a) Neutral: (i) VPs where tense could not be determined by the morphology (e.g., *put*, *cut*, other than third person singular); (ii) nonfinite VPs consisting of freestanding progressive dependent clauses (e.g., *The woman held her baby with the cat chasing the frog*).

- b) Bare: (i) bare stems that were grammatical errors (e.g., *The mother hold the baby*); and (ii) bare progressives, i.e., without an auxiliary (e.g., *The boy ∅ cutting it; The frog ∅ jumping*), produced by children who have difficulty with the auxiliary system or who are in a picture description mode (e.g., *Carrying the wood | Sawing it | Putting a cover over the wood*),

## .2 Aspect

Each VP was coded according to a non-progressive or progressive dichotomy.

### 1) Non-progressive:

- a) Simple: Finite VPs with simple verb morphology (e.g., *The boy builds the monster; The woman threw her coffee at the frog*).
- b) Compound non-progressive: Finite VPs with: (i) *do* or *have* auxiliaries (e.g., *Do you think there's any frogs? And they had built a stick as a dinosaur*); (ii) modal auxiliary verbs (e.g., *They can see it every night; We should do something*); or, (iii) the semi-modals *have to* and *be about to* (e.g., *And the mom has to go in and get it; The cat pushed the frog down and was about to eat him*).
- c) Complex non-progressive: Finite complex VPs consisting of a verb with simple morphology and one or more chained infinitival complements; e.g., *The boat starts to sink; He wanted to see the monster*).

### 2) Progressive

- a) Basic progressive: Finite compound VPs with the *be* auxiliary combined with a participle *-ing* form of the main verb (e.g., *He's catching bugs; The boy was building the monster*).

- b) Compound progressive: Finite compound VPs with: (i) *have* (and *be*) auxiliaries combined with a participle *-ing* form of the main verb (e.g., *They've been looking in the woods*; *His older sister who had been reading the book picked out the boat*); or, (ii) with the modal, e.g., *will + be + going + infinitival to + bare verb stem* (e.g., *The boys will be going to build something*; *They must be going to try to scare somebody*; *The frog could be going to catch a fly*).
- c) Complex progressive: Finite complex VPs with a participle *-ing* (e.g., *The cat keeps on running after the frog*; *The cat is trying to catch the frog*; *They kept on having to build it*; *The baby started crying*).
- d) Nonfinite progressive: Nonfinite *-ing* dependent clauses that contribute an additional VP to the C-unit (e.g., *There was a frog hopping around*; *He saw some people picnicking*; *The frog hopped away with the cat chasing after him*).

### .3 Shifts in tense in the main narrative

To code for shifts in tense in the main narrative, each VP was compared to the first preceding verb marked for tense. Unmarked VPs (neutral or bare) were considered non-intervening.

- 1) A tense shift occurred when a VP differed in tense from that immediately preceding it, e.g.,  
*They decided to move*[Past], *but the last guy they scare*[Pres][SW\_tense]  
*fainted*[Past][SW\_tense].
- 2) If a child moved in and out of quoted speech using framing clauses (i.e., each C-unit contained narrative and quoted speech), no tense shift was coded in the main narrative, e.g.,  
*The boy said*[Past] “*can't find any places*” | *And the little boy said*[Past] “*well I want to prank*”.

## Appendix C: Temporal lexical items

*Temporal lexical items that occurred in the sample, by category*

Category	Temporal Lexical Items
Aspectual verbs	come, finish, get, go, keep, keep on, manage, run, start, stop
Connectors	<p>All-purpose connectors and</p> <p>Sequencers and then, then</p>
	<p>Sequential connectors after, before, first, next, now, second</p> <p>Simultaneous connectors as, at the same time, meanwhile, once, when, while</p>
Other temporal expressions	again, all the time, already, all around, all day, all over, along, always, around, around and around, at last, at the end, day, during the day, finally, it was time, just, last time, later, next day, next time, now, once, once after, quite a while, right now, soon, still, suddenly, that time, this time, until
Formulaic lexical items	ever after, once, once at a time, once in a time, once upon a time, one day