# NARRATIVES OF YOUNG CHILDREN WITH LANGUAGE IMPAIRMENT: FORM VERSUS CONTENT

by

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## Abstract

It has been proposed that narratives reflect a diverse knowledge base. In the narratives produced by children with normally developing language, it is difficult to tease apart the various knowledge domains. However, for children with specific language impairment (SLI), there is asynchrony in the development of at least two knowledge domains, event knowledge and linguistic knowledge. This asynchrony makes it easier to separately examine these knowledge domains within the narrative context. Narrative event knowledge was the focus of this thesis. In particular, two studies were conducted to examine the narrative content structure abilities of younger children with SLI. In Study One, 10 children with SLI, ranging in age from 4-6 years, were language-matched with 10 normal-language (NL) children, ranging in age from 2-4 years. Two sets of line-drawn picture cards were used to elicit two separate narratives. A developmental narrative stages scheme, based on Trabasso, Stein, Rodkin, Munger and Baughn's (1992) research, was devised to score the data. It was hypothesized that children with SLI would produce narrative content structure in advance of their NL counterparts, given their age advantage and likely accompanying advantage in world experience and cognitive development. Data from the group with a lower language level supported the hypothesis. No strong trends were apparent for the group with a higher language level. Study Two mental age (MA) -matched 8 children with SLI (mean MA, 68 months) with 8 NL children (mean MA, 72 months). It was hypothesized that matching by mental age would hold cognitive abilities constant so therefore the two groups would produce equivalent narrative content structure. Overall findings in Study Two supported the hypothesis. However, data from the higher MA-matched group indicated a trend in which children with SLI produced less advanced narrative content structure than their NL counterparts. The two studies, taken together, suggest that as children develop, language experience plays an increasingly significant role in narrative content production.

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# Dedication

I wish to dedicate this thesis in loving memory of my sister, Carol Anne Mehmel. Carol's joyful pursuit of excellence, her dedication to everything and everyone that was important to her, and her energetic determination, cut short by her untimely death, inspired me to begin my academic journey, culminating in this thesis. Her spirit continues to sustain me.

# Chapter One

# INTRODUCTION AND REVIEW OF THE LITERATURE

## Introduction

That many if indeed not all societies and cultures have a strong narrative tradition underscores the importance of narratives. Part of the importance of narratives lies in the power they have to entertain (Kemper, 1984) as well as to educate (Segal, 1995). In an educational context, narratives can serve to link a culture's past with the present. Moreover, one of the means by which members of a culture establish and convey a collective identity is through narratives.

We can therefore derive a sense of knowing and understanding our place in the world through exposure to narratives. In other words, narratives can help us make sense of the world (Schank, 1990). For example, narratives provide us opportunities to vicariously experience events and situations without having direct involvement (Segal, 1995). Conversely, in order to create narrative, we need an understanding of the world, for example, cause and effect relationships (e.g., Westby, Van Dongen, & Maggart 1989; Trabasso, van den Broek, & Suh, 1989; Kemper, 1984); one means by which we obtain world knowledge is through direct experience.

A narrator draws upon a wide knowledge base to tell a story. The storyteller must incorporate linguistic knowledge, event knowledge (derived from real world experience), social interaction knowledge, and knowledge of listener needs (Hudson & Shapiro, 1991; Stein, 1988), all of which are supported by a number of cognitive processes (Segal, 1995). These cognitively-based knowledge domains converge to produce a coherent narrative, that is, a narrative that has a logical sequence of events. Studying narratives can therefore provide valuable insight into a number of knowledge domains as well as cognitive processes from which the knowledge

domains arise.

By considering the acquisition of narratives, it may be possible to observe or infer how some of these domains interact and affect one another as they are brought to bear in the creation of a story. Of particular interest is how event knowledge and linguistic knowledge might interact in the guise of narrative *content* and *form*, respectively. Under normal circumstances, a young child, acquiring narrative skill, first draws on knowledge of particular event types. Subsequently, the child must develop a higher-level, conceptual understanding of how events are related in order to formulate coherent story content. This conceptual understanding requires a certain degree of cognitive development obtained through world knowledge and experience. The child must also give linguistic form to the story event(s) in order to convey or communicate the intent of the narrative. Among other things, this requires packaging the story in a narrative structure (Hudson and Shapiro, 1991; Johnston, 1982a). How proficient the child is at manipulating these aspects of story (representing different knowledge domains) will determine, at least in part, how satisfying the final product is to the listener. If linguistic knowledge and event knowledge are not equally well established, in other words if there is asynchronous development between these two domains, then the imbalance may have a deleterious effect on some aspect of the final narrative product, for example, coherence.

Children with specific language impairment (SLI) fit the profile of asynchronous development between event knowledge and linguistic knowledge. Recall that linguistic knowledge gives rise to narrative form while cognitively-mediated event knowledge gives rise to narrative content. Given that children with SLI are apt to produce inadequate narrative form because of underdeveloped linguistic knowledge, is their cognitively-driven event knowledge nonetheless sufficient to produce coherent narrative content? The present study is concerned with the

narrative content abilities of young children with SLI and seeks to address the above question.

In order to more fully appreciate and understand the narrative abilities of children with SLI, it is helpful to first consider narrative development in children with normal language. A brief review of normal narrative development provides a standard by which to compare and measure language and cognitive asynchrony, the hallmark of the SLI population. Therefore, Chapter One presents a literature review that first considers the nature of and the developmental trends evident in narrative research of children with normal language.

Narrative content and the cognitive development necessary for its construction, are the focus of this study. However, a brief discussion of the developmental trends in narrative form will provide the backdrop from which to elucidate the asynchronous development between language and cognition in children with SLI. Narrative form will be divided into a) the linguistic features of cohesion and reference, and b) narrative discourse form, realized in story structure or grammar. Narrative content will be discussed in terms of event knowledge. 'Real life' scenarios in stories derive from event knowledge, and can, in turn, become the basis from which fictional story content is built (Hudson & Shapiro, 1991). Therefore, event knowledge is fundamental to narrative content. Finally, the conceptualization of narrative events into goal plans (e.g., Trabasso, Stein, Rodkin, Munger, & Baughn, 1992) and the relation between event elements, e.g., causality (Trabasso et al. 1989), are complementary to narrative content. They provide content structure in a narrative. Thus, goal plans and causality will be included in the narrative content discussion.

Cognitive processes are necessary for a child's understanding and mental representation of events (K. Nelson, 1986a) as well as supporting language acquisition. Moreover, they provide

the tools by which a child constructs the content structure of goal plans and causality. Because cognitive processes can impact linguistic knowledge, event knowledge and content structure, they will be discussed in the context of narrative form and content.

The final section of Chapter One will consider the literature on narratives of children with SLI. It will begin with an examination of the cognitive competencies and deficits identified in children with SLI. This cognitive profile will then be considered in the context of narrative form and content, and the section will conclude with predictions about narrative ability of children with SLI, given their cognitive makeup.

Chapter Two will outline the methodology of the study, including the analysis procedure and the criteria for the developmental narrative stages scoring scheme generated for this study. Chapter Three will report the results of the study as they relate to the research hypotheses posed in Chapter One. In the context of previous research on narrative development of children with SLI, Chapter Four will discuss the implications of the results and how they relate to the research hypotheses formulated in Chapter One.

## Review of the Literature

### Research on Children's Narratives: Form Versus Content

The goal of this section is to review two key narrative components, form and content, and the cognitive development necessary for both narrative components. This review of the narrative abilities of normal-language children, with an eye to cognition and its relation to form and content, will provide a framework from which we can understand the narrative abilities of children with SLI. In particular, it will serve to highlight the asynchrony between language and cognitive development in the SLI population.

## A Brief Review of Form in Children's Narratives: Characteristics and Developmental Trends

As previously stated, narrative content in relation to cognitive development in children with SLI, is the focus of this study. However, a cursory review of linguistic narrative components (i.e., narrative form) is needed in order to understand the relationship between language and cognition, as well as to provide the framework from which to understand the linguistic components of SLI. Moreover, it serves to underscore the linguistic nature of narrative text. Two aspects of narrative form that will be reviewed are: 1) cohesive devices and 2) text structure.

### Cohesive devices.

Research on children's narratives has tended to focus on form. Aspects of narrative form have been defined by Hickmann (1997) and Karmiloff-Smith (1985) as the surface level, sentential connections of a narrative achieved through the use of linguistic devices which link sentences together. In particular, many researchers (e.g. Bennett-Kastor, 1986; Griffith, Ripich, & Dastoli, 1986; Hickmann, 1997; Karmiloff-Smith, 1985; Liles, 1985a & 1987; Purcell & Liles, 1992) have investigated linguistic components of narrative form such as cohesive devices. We can consider cohesion as the property of connectedness that distinguishes a text from a set of unrelated sentences. Cohesive devices are the linguistic tools for connecting or linking sentences together. Research on cohesive devices has alternately been concerned with linguistic connectives such as 'and', 'and then', 'but' etc. (e.g., Liles, 1987; Bennett-Kastor, 1986), reference using pronouns, or definite/indefinite nominal phrases, and ellipsis in which the speaker eliminates redundant information (e.g., Griffith et al., 1986; Hickmann, 1997; Hickmann, Kail, & Roland, 1995; Hickmann, & Schneider, 1993).

A brief review of some developmental trends in narrative form/cohesion.

The development of text cohesion, in general, is a long process which starts early and continues into the school years (Ruthven, 1989). It is reasonable to expect narrative development to follow a similar trend. This section will present two studies as examples of developmental trends in narrative cohesion. These two studies were chosen because they emphasize the link with cognitive development. Karmiloff-Smith (1985), argues that we can either view the development of narrative cohesion from a surface perspective, i.e., output, or we can consider the underlying processes and representational change that mediate cohesive development. Karmiloff-Smith chooses to focus on the latter option. Her research, therefore, is particularly interesting because it focuses on cognitive aspects of cohesion. In her study, Karmiloff-Smith uncovers three levels of development in narrative cohesion. At level 1, linguistic markers in early narratives tend to be driven by extralinguistic stimuli resulting in a narrative that lacks overall cohesion. For example, a child uses referential terms such as 'that one' that may be ambiguous to the listener but are clear to the child who uses deixis to point to an extralinguistic referent. At level 2, the child is rigidly constrained by the thematic subject. In other words, once the child decides who the main protagonist is, the child unwaveringly slots the referent into the subject position. At level 3, there is a greater balance between linguistic and cognitive processes which allows for greater flexibility in linguistic expression. For example, the child allows both main and subsidiary protagonists to occupy the subject slot, but the child tends to explicitly mark the distinction by such means as strictly reserving pronominalization for the main protagonist and using the definite NP for subsidiary protagonists. Distinguishing main and subsidiary protagonists in this manner affords the listener the means of following and maintaining the connection of who is being referenced from utterance to utterance. Karmiloff-Smith argues that the above developmental sequence represents a progression from bottom-up to top-down, cognitively-

controlled discourse structure.

In her study of the early developmental progression of cohesive connectives in narrative, Bennett-Kastor (1986) found children aged two have the fewest inter-clausal connectives and rely almost exclusively on 'and' and 'then', while three- and four-year-olds show greater experimentation with connectives, favoring 'and' as well as 'and then' but nonetheless using all connective types. Five year olds, on the other hand, show more stability in connective use, and use a greater repertoire of cohesive connectives. Rank order of use across all groups is as follows: 'and', 'then', 'so', 'but', 'first', 'when'. We can understand this progression in the context of cognitive development. As the child develops cognitively, and consequently acquires a greater understanding of object and propositional relations, the child requires a wider repertoire and varied use of connectives to express this underlying knowledge.

Narrative structure.

The second major area of research in narrative form is concerned with the macro structure of narrative. Hudson and Shapiro (1991) refer to the knowledge required to identify and produce the story genre as macrolinguistic knowledge. As such, narrative structure, or "story grammar", can be considered the global linguistic form which supports local linguistic devices. From a psychological perspective, narrative structures can be thought of as mental representations of how stories should structurally advance or progress. According to Rumelhart (1980), such story schemata provide the means of packaging the knowledge of narrative structure in a unit to be stored in memory. From either perspective, story grammars or schemata are structures that serve to organize the text into a coherent whole (Hudson & Shapiro, 1991).

When manifest in narratives, story structures consist of hierarchical constituents, which are logically and temporally connected. A variety of story grammars have been constructed to describe these (e.g., Botvin & Sutton-Smith, 1977; Labov & Waletzky, 1967; Stein and Glenn, 1982). As typically described, the units of a story grammar include a Setting and the episodic constituents of Initiating Event, Internal Response, Attempt, Consequence, and Reaction (Liles, 1993; Stein & Glenn, 1982). The setting introduces the main character and provides background information relevant to the story; the Initiating Event is a physical or internal occurrence that sets the storyline in motion; the Internal Response is the emotional response the protagonist has to the initiating event; the Attempt is the action taken to resolve the situation; the Consequence depicts the outcome of the attempt; and the Reaction is the protagonist's internal response to the outcome (Stein & Glenn, 1982). Although these units are defined in content terms, the categories are very general in nature, and the structure, outlined above, governs each story, regardless of its particular content. It is for this reason that the story grammar is considered more a matter of form than of content.

We are able to construct story schemata because of repeated exposure to stories (e.g., Stein & Glenn, 1982; Mandler, 1984). In particular, with successive exposure to stories, we are able to abstract regularities from stories in order to construct a mental representation of their general form, i.e., a story structure or story schema. As formulated by Stein and Glenn, rule-based story grammars and story schemata are independent of content or event.

The developmental progression of narrative structure.

It is important to consider the development of narrative structure, not only from the perspective of narrative form, but also from a cognitive perspective because it can elucidate the underlying cognitive development needed to support such growth. Therefore, this next section will detail

narrative structure development in the context of cognitive development.

Children's narratives have been described as progressing through a series of developmental stages. Applebee (1978) characterizes children's storytelling as initially concerned with labeling or description. At this stage, events appear arbitrary and lacking in connection (around age 2). Eventually children's narratives develop to include related events focused around a central incident (approximately at age 5). Berman (1988) likewise notes a similar developmental trend based on her study of children's narrative production when the narrative stimulus is a wordless picture book. Younger children tend to narrate events in isolation but older children tend to link events and eventually hierarchically imbed narrative events. Stein (1988) likewise outlines the development of narrative on the basis of relations between narrative events. Initially, a child's narrative tends to ignore both temporal and causal relations between events and is purely descriptive in nature. Children then tend to progress to stages where events are first temporally connected, then causally connected. This is supported by other research findings (e.g., Berman & Slobin, 1994b; Trabasso & Nickels, 1992). In later stages, events are goal-oriented but a child may or may not include obstacles or outcomes. Finally, stories are constructed that include goal, obstacle, and outcome. Crais and Lorch (1994) argue that the development and refinement of narrative form continues even past school entry.

Researchers recognize the important role cognitive development plays in this developmental sequence. For example, Haslett (1986) as well as Botvin and Sutton-Smith (1977) argue that a child's narrative skill is limited by cognitive skill. As the child matures cognitively, structural complexity likewise increases. In particular, cognitive growth allows the child to think beyond individual structural elements in order to produce a globally constructed/hierarchically

organized story, in other words, a coherent story. Cognitive development also provides the child with an understanding of the temporal and causal relationships that can serve to link events. Some additional cognitive prerequisites needed in narrative development include the ability to move from the present to non-present, as well as the ability to distinguish reality from fantasy (Kuczaj & McClain, 1984).

It is clear from even this brief summary, that research which seeks to illuminate the bridge between narrative structure and knowledge of goals (e.g., Stein, 1988; Berman & Slobin, 1994b), begins to traverse the boundary separating form and content. Others (e.g., Trabasso et al. 1992; Trabasso & Nickels, 1992) have gone even further to consider the link between events in narrative content and the conceptual representation of such knowledge. Research in this area can be considered to have narrative content as its starting point and as such will be discussed in the next section.

It is also evident from this brief review of the development of both narrative cohesion and narrative structure that cognitive processes influence narrative form. Cognitive operations are needed in order to drive top-down mediation of narrative cohesion. Likewise, representation of a story schema in memory requires involvement of cognitive processes. Furthermore, on-going refinement of narrative ability is supported by cognitive growth.

At this juncture it is interesting to consider how cognitive development interacts with other aspects of growth. In order for cognitive development to occur, a child must interact with the physical and social/cultural environment. In other words, a child must have experience with the world in order to develop cognitive capabilities. The symbiotic relationship of experience and cognitive processing ability will be investigated in the review of narrative content. This

interaction and the effect on narrative coherence will then be considered in the context of children with SLI for whom cognitive ability, at least in some areas, may be impaired.

## Content in Children's Narratives: Characteristics and Developmental Trends

In contrast with research on narrative form, relatively less research has focused on narrative content. Despite the comparatively small body of research in this area, the literature highlights three aspects of content in narratives. These aspects of narrative content will be discussed in the paragraphs below and will include 1) event knowledge which gives rise to 2) scripts and 3) plans. In particular, this section will examine how a child acquires event knowledge and will investigate the form event knowledge takes in the child's memory. Does the child move from specific event memory to more general event representations? The following literature review will address this question. The discussion will also include a section on narrative content structure, which is a highly conceptualized, abstract framework of generalized content. Content structure is important to this discussion because some researchers argue that event knowledge is the building block of narrative content structure, realized in goal plans and causal chains. Furthermore, content structure is relevant to the discussion about the progression from specific events to more general conceptualizations. Therefore, goal plans and causal chains will also be included. Finally, the cognitive processes involved in event structure will be discussed.

### Event knowledge.

Children interact with their environment and, in so doing, acquire knowledge of events within the environment. Children can then use their newly acquired event knowledge as a reference point from which to guide their understanding of the world around them. Children must call on this event knowledge in the creation of narrative content. Therefore, it is of interest to review

the nature of event knowledge. This section will define event knowledge and will review how it is acquired.

Let us first consider what content or event knowledge is and how it relates to narratives. Hudson and Shapiro (1991) contend that content knowledge, utilized in narrative production and comprehension, comprises "generalized event representations, memories of specific episodes and stories, and knowledge about common types of social interactions" (p. 89). They go on to argue that for a child to construct a story, the event depicted must be drawn from general event knowledge or from a particular situation captured in episodic memory, or it must be built from memory of a fictional story. Moreover, to comply with the story genre the child must introduce the story with a problem that requires resolution. Hudson and Shapiro state this knowledge comes from an understanding about situations that go awry, in both the physical world and in the psychological world of social relations. Experience, primarily obtained by direct interaction with an environmental phenomenon, be it physical, cultural, or social environment, or, secondarily, by listening to the narration of events in a story, provides the foundation on which event knowledge is built (K. Nelson, 1986a; Slackman, Hudson, & Fivush, 1986).

Events have been defined as a dynamic compilation of object(s) and the relation of object(s) to the environment, resulting in a change of state that occurs over time (Berman & Slobin, 1994a; K. Nelson, 1986a). Events must be conceptualized in memory (Schank & Abelson, 1977). According to K. Nelson (1986a), events are the initial catalysts in the process of conceptualization. But how do these events come to be represented in memory? In studying autobiographical memory, Hudson and K. Nelson's (1986) findings have led them to argue that a single occurrence or episode may be stored in autobiographical or episodic memory (and, as

such, is contrasted with semantic memory because it is devoid of abstract semantic categories, according to Schank and Abelson, 1977). Subsequent exposure to similar events leads to the establishment of a general event schema in which elements are organized and abstractions evolve. On the other hand, Fivush and Slackman (1986) argue that a single event may, likewise, be stored as a general event representation, from which subsequent similar events may be measured and judged. The general event representation is then, in turn, shaped by repeated exposure to similar events. With each event repetition, the general event representation becomes more conceptualized. Cognitive processes mediate this conceptualization (K. Nelson, 1986a).

K. Nelson (1986a) outlines the sequence from world experience to representation as beginning with the perception of an event. The perception then becomes the first representation of the experience. These early representations are important, according to K. Nelson, because cognitive processes cannot act on real world occurrences but only on the mental representation of those occurrences. (More information on the cognitive processes, which operate on and interact with mental representations, will be presented later in this chapter.) It is important to note that even the initial perception can be influenced by what is salient to the child so that a perceptual bias may occur, which will, in turn, affect the subsequent representation (K. Nelson, 1986a).

As a result of repeated event exposure and through cognitive mediation, the perceptual representation eventually evolves into a generalized schematic representation or event schema (K. Nelson, 1986a). The subsequent event schema is based on concrete experience and, as such, specifies spatial and temporal relations among its constituents. However, it is also an abstraction because it contains generalizations about the range of possible

constituents rather than specific exemplars (K. Nelson, 1986a). Based on Rumelhart's (1980) explanation of the role of a schema, we can conclude that the event schema, likewise, is the foundation from which various cognitive operations can occur. The event schema motivates memory retrieval, organizes information processes, and allocates resources. Note the reciprocal relationship between cognition and event schemata. Cognitive processes mediate the instantiation and refinement of an event schema. On the other hand, event schemata organize and increase the efficiency of cognitive processes.

According to Rumelhart (1980), our perception of events is typically directed by goals. If we perceive events to be random and unconnected then they have no meaning, and are therefore not committed to memory in an event schema. On the other hand, if we perceive events within the framework of a goal, then the connection among event constituents will facilitate schematization. Furthermore, when events are causally connected, they tend to reinforce children's understanding of temporal sequencing (K. Nelson, 1986a).

K. Nelson (1986a) argues that a child may have an incomplete event schema or representation if the child fails to identify the importance of some aspects of the initial event or fails to comprehend some of the relations involved. In a top-down cognitive processing manner, the child will make judgements of salient features of an event, based on the child's previous experience. It will then be instantiated in an event schema. The process will therefore be guided by the constraints imposed by the child on his or her initial perception and perspective. Nevertheless, K. Nelson and Gruendel's (1986) research indicates that children's focus on salient features in an event does not tend to be idiosyncratic. Therefore, the resulting representation will likely contain central features common across children.

Other factors influencing the course and strength of an event representation include event familiarity. According to her findings, Hudson (1986) argues that the more familiar a child is with a situation the stronger and more complete the representation. Another factor is the degree of participation in the event. In particular, the more direct, interactive participation a child has in an event, the greater the likelihood of a complete representation (Slackman, Hudson, & Fivush, 1986). Slackman et. al (1986) also argue that if a child's goal is involved in an event, rather than a simple adoption of an adult-chosen goal, the child is more invested or motivated, therefore increasing the likelihood of a stronger representation.

Finally, the temporal/causal structure of an event delineates the boundary of the event and is instantiated in the representational event schema (Schank & Abelson, 1977). The temporal/causal relationships in the event schema are hierarchically ordered. In particular, subordinate segments of activities are imbedded within the temporal/causal structure. Cognitive processes mediate the creation of an event schema hierarchy.

Scripts: A Subtype of Event Knowledge.

Recall that event knowledge follows a course from specific instance or occurrence (i.e., an event) to a more general conceptualization, captured in memory. It is the latter, i.e., generalized knowledge, which is most crucial to narrative content. One type of generalized knowledge schema is the script. Scripts can be considered one of the initial, organized, general schemes from which a child understands and represents the world. As such, scripts are relevant to the discussion of event representation in narratives and will therefore be highlighted in this section.

Scripts are a type of event schema (K. Nelson, 1986a), or general event representation based

on real world experience (Slackman et al., 1986). Schank and Abelson (1977) define a script as a " predetermined, stereotyped sequence of actions that defines a well-known situation" (p. 41). An example of such a stereotyped sequence of actions is the birthday party script in which a cake with lit candles is presented to the birthday celebrant after which the candles are blown out. Cake and ice cream are then eaten and birthday presents opened. Scripts, such as the one just presented, are general structures (K. Nelson, 1986a). In other words, one event episode may result in a script-like representation but the script will apply to all instances of the event; it is not exclusive to one particular instance. Likewise, numerous encounters with similar events will result in a more highly conceptualized, general script.

According to researchers such as Shank and Abelson (1977) and Spiro (1980), we comprehend new events based on structured representations of previously encountered events. Other researchers (e.g., Fivush & Slackman, 1986; Hudson, 1986; Hudson & K. Nelson, 1986) further argue that children draw on general event representations to mediate the representation of both novel and familiar events. For example, if a particular event is unusual and atypical and, therefore, does not follow the pattern of the usual, familiar event, it will not be incorporated into the general script but will be encoded as an exception in episodic memory (Hudson, 1986). If, on the other hand, the atypical event is encountered again, it can eventually be subsumed by the general event representation as an optional feature. Hudson (1986) proposes that this is how events in episodic memory can become schematized. A script, therefore, captures the organization of certain real world events as well as the inherent variability of the world (Slackman, Hudson, & Fivush, 1986).

It is important for us to keep in mind that event schematization is made possible through cognitive processes. Cognitive processes such as attention, perception and memory are

engaged in the instantiation of scripts. There is, likewise, a reciprocal relationship between scripts and cognition. According to Slackman, Hudson and Fivush (1986), scripts are automatically activated when we encounter familiar events. Thus, we are able to automatically and implicitly comprehend and recall information mediated by the activated script. Scripts also enable children to make inferences about script-activating situations when all the information is not explicitly provided (K. Nelson, 1986a). Scripts provide the material to fill in the gaps of missing information.

Schank and Abelson (1977) argue that when scripts are fully realized, they are goal-oriented in that a central objective mediates the progression of the script. According to studies they conducted, K. Nelson and Gruendel (1986) argue that children as young as three provide evidence of script induction. Moreover, Fivush and Slackman (1986) argue that children this age organize scripts along spatial, temporal, and causal indices. Scripts also contain slots for possible elements (Schank & Abelson, 1977). The script as a holistic entity has allocated slots to be filled; once one slot is filled it determines how subsequent slots must be filled. Scripts are therefore hierarchically organized and may contain embedded subscripts (K. Nelson, 1986a). There are optional and required elements as well as conditional relations (K. Nelson, 1986b). In addition to slots, scripts also specify roles and actors to fill the roles, actions to be carried out and necessary props (Schank & Abelson, 1977). For example, in a hair-cutting script, the roles are minimally the hair stylist, and client, the actors are those characters filling the roles, the action is cutting hair and the prop is a pair of scissors. Some variability exists in the hair-cutting script; for example one can visit a barbershop or a beauty salon. Once the slot for type of hair-cutting establishment is filled, subsequent slots will be filled accordingly.

Ontogenetically and logically, scripts are likely the precursor of true story construction. At a

very early age, children demonstrate knowledge of scripts depicting familiar events and use this knowledge to guide their understanding of novel events (K. Nelson, 1986a). Likewise, young children tend to rely on script knowledge and structure to construct a 'story', either because they lack knowledge of narrative structure, or because their story structure knowledge is not yet completely operational (Seidman, Nelson, & Gruendel, 1986). As a result, their 'stories' tend to bear more characteristics of scripts, rather than stories. Even though the script may share the same event structure as a story, the presentation will be different. For example, the script-based story may be told in the timeless present tense and lack problem/resolution sequences, whereas stories usually have beginning and end markers such as 'once upon a time' and 'the end', are told in the past tense, and focus on a problem to be solved. For younger children, the use of script structure rather than narrative structure tends to be more likely if the subject matter is a familiar event. Seidman et al. suggest this may occur because of competition between the less well-developed story structure and the more well-established, less abstract script structure. In the end, the more readily available, and more developed script structure will win out. Once a child's narrative ability develops sufficiently to make a clear separation between script knowledge and narrative form, the child's story-telling evolves to include problem-resolution scenarios. Thus, the transition from script structure to narrative structure is an evolutionary process built on general event knowledge, and mediated by cognitive processes (K. Nelson, 1986b).

Scripts: developmental trends.

Recall from the brief review of developmental trends in narrative form, that children need to interact with the environment, be it linguistic, physical, or social, in order to develop and enhance narrative form. Likewise, cognitive growth is needed in order for the child to comprehend and express the forms that indicate relationships within a narrative, to develop a

more conceptualized representation of narrative structure and, finally, to develop a more cohesive narrative package. Trends are likewise evident in children's script development. There is a rich literature on these developmental trends, and Fivush and Slackman (1986) provide an additional interesting account based on their study of children's script knowledge of their kindergarten daily routine over time.

With increased event experience, coupled with cognitive growth, children produce more elaborate, detailed scripts. For example, when recounting the daily kindergarten routine, children in the Fivush and Slackman study included more component activities in the daily routine as a function of greater experience. According to Fivush and Slackman, temporal organization also becomes more complex and probabilistic in that children tend to include conditional statements in their script accounts. For example, in the Fivush and Slackman study, children used conditional statements such as 'If we finish snack early, then we can play' to denote contingencies in the daily routine. These conditional statements also reflect the children's growing understanding of causality. Similarly, Fivush and Slackman argue that children's use of 'before' and 'after' statements such as 'But before we eat, we have to wash our hands' reflects temporal flexibility or temporal reversibility; i.e., the ability "to move back and forth in reporting the daily routine" (p. 84). Children are not locked into a strict temporal order but can flexibly make corrections or additions to the scheme as well as indicate to the listener where the addition belongs in the temporal sequence. Cognitive operations allow such flexibility. Moreover, with increased experience and cognitive development, children show evidence of hierarchically organizing the script. Finally, the script tends to become more abstract or schematized as a result of experience and cognitive input. For example, Fivush and Slackman have found that, over time, children include more actions in their scripts but the actions tend to be less explicitly detailed. Fivush and Slackman argue that children include

less detail in these instances because each action comes to represent a collection of possible activities, and, as such, the action labels begin to function like superordinate category labels.

Fivush and Slackman (1986) also recognize the influence that age and the accompanying gains in cognitive ability have on scriptal representation. In particular, based on research, they argue that when experience is the same, older children, having greater cognitive development, formulate more abstract, schematized scripts. Research also indicates that younger children are more bound to their internal script representations when faced with a task while older children show greater flexibility in script use. In particular, Hudson and Fivush (1983) conducted an experiment requiring 3- and 5-year-olds to retell a script-based story twice under two experimental conditions. In one experimental condition, the children were told the story then invited to retell it. After the first retelling, the children were once again presented with the same story and invited to retell it once more. In the second experimental condition, children were told the story twice before being asked to retell the story two times in a row. In both conditions, the 3-year-olds recalled the story in its correct sequence but did not add any further information when probed nor did the quality or quantity of their stories differ upon successive retelling. In contrast, the 5 year olds recalled more information and improved the organization of their stories with successive retellings, regardless of whether the examiner presented the story between retellings. Moreover, in contrast with the 3 year olds, they were able to recall more information through probing and were able to incorporate this additional information into their second retelling of the story. Based on Hudson and Fivush's results, Fivush and Slackman (1986) conclude that younger children must rely on implicit scriptal representations while older children are able to make explicit use of scripts, thus affording them greater flexibility to make adjustments when necessary. Higher-order, cognitive operations mediate explicit use of scripts, thus, allowing flexibility in thought.

Goal plans and causal relations.

Thus far, the content of narratives reflects event knowledge in both general and specific ways. As Hudson and Shapiro (1991) argue, event knowledge in narratives can be derived from general event knowledge or from a particular episode stored in episodic memory. Let us turn now to another major aspect of the content used to drive narratives, namely goal plans and causal relations.

If we define story action as motivated by a goal (e.g., Stein & Glenn, 1982), then we have to specify a goal plan model such as posited by Trabasso and colleagues (Trabasso et al, 1992; Trabasso & Nickels, 1992; Trabasso & Rodkin, 1994). Goal plans are the conceptualization of goal-directed action, organized in a plan. Goal plans can be considered to evolve from the internal representations of goal-driven scenarios derived from world experience. Story grammars tend to fall short of the goal plan model. Story grammars provide the rules for structuring or sequencing story elements, independent of content, but they do not specify how a sequence of events, comprising story content, should be organized in a planned, goal-oriented schema. In other words, story grammars are silent with regard to the mental representation of goal plans. To illustrate, story grammars typically include the following categories: Setting, Initiating Event, Internal Response, Attempt, and Consequence. Note the absence of a goal or a plan from these categories.

Likewise, event knowledge and the instantiation of event structure fall short of a goal plan model. Neither one, on its own, is adequate to guide the storyteller's connection of events in a goal-directed sequence. A coherent narrative is possible only when the storyteller infers a causal connection between events, motivated by a central goal (Trabasso & Nickels, 1992).

While scripts may provide the rudimentary foundation for event representation in narrative, a child must also have a higher-order, cognitively mediated understanding of how different events in a story are causally connected and linked in a goal plan-oriented matrix (Schank & Abelson, 1977). Script structure does not specify a mechanism or motivation for connecting one script to another in a coherent, goal-driven narrative package. To produce a true narrative, a child must not only understand these relations between events but must evoke this content structure as the framework for telling a story. Plans, according to Schank and Abelson (1977) connect events that cannot be satisfactorily linked by a script. They represent general information about how story characters accomplish goals by delineating choices available for goal achievement. Ultimately, plans enable a narrator or the hearer of narratives to make inferences about the significance and purpose of actions in a story.

Goal plans (Trabasso & Rodkin, 1994; Trabasso & Nickels, 1992; Trabasso, Stein, Rodkin, Munger, & Baughn, 1992) and causal relations (Trabasso, van den Broek, & Suh, 1989; Trabasso, Secco, & van den Broek, 1984) have been identified as the key conceptualization a child must undergo and actively utilize in order to narrate a 'good' story. This section will examine the nature of goal plans and causal relations in children's narratives and their connection to narrative content.

Goal plans are mental schemata or representations of event sequences in which the protagonist is involved in a predicament that requires a solution (Trabasso & Nickels, 1992). Goal plans are the logically-based conceptualizations of how events are causally linked both locally (i.e., within an episode) and globally (i.e., between episodes), with emphasis on global links (Trabasso et al., 1992). Our experience-based knowledge of goal-driven behaviour or action gives rise to schematized goal plans. Among other things, the instantiation of a goal

plan guides our interpretation of everyday social interactions. As a schematized representation, goal plans must be cognitively-based. According to Trabasso et al. (1989), the *narrative* goal plan schema "is a representation of the underlying, conceptualized content" of the narrative (p.2). On a surface level, narrative content drives the narrative goal plan schema. Narrative events (i.e., content) can be seen as part of the foundation from which the narrative goal plan representation arises. Narrative goal plans are conceptual representations, cognitively derived, but they nonetheless remain closely tied to content. Indeed, they serve to conceptually structure narrative events or content (Trabasso & Rodkin, 1994). Trabasso et al. (1989) argue that narrative goal plans extend over a series of events.

When the child is constructing a narrative from a sequence of pictures, the process of interpreting the presence of a goal is constrained not only by what the child knows of goals and plans but also by what the child identifies in terms of event content (Trabasso & Nickels, 1992). Cognitively-driven, top-down processes mediate this activity. In order to integrate perceived events into a coherent, overarching goal plan, Trabasso and Rodkin (1994) argue that a number of cognitive operations, such as retrieval and processing information from memory stores, as well as inference, converge to achieve that end.

If a child is using a goal plan representation when creating a narrative about a series of pictures, then he or she will encode and explain events as mediated by and linked together through a plan to achieve a goal (Trabasso et al., 1992). There are a number of different types of relationships that serve to link constituents in a goal plan. For example, as previously stated, an individual event can be connected through causal relations. Trabasso & Rodkin (1994) argue in favour of using the logical criterion of necessity to define causal relations, that is, event X causes event Y if the absence of event X results in the absence of event Y. When

causal relations are present and are coupled with goal plans, they ensure global and local coherence (Trabasso et al., 1992; Trabasso & Nickels, 1992).

Likewise, constituents in events may be linked together by an enabling relationship (Trabasso & Rodkin, 1994). Enabling relations occur when one constituent allows the occurrence of another. For example, settings can enable all other episode constituents. Moreover, episode constituents can be connected by a physical relationship or by psychological causation. A physical relationship can link action and outcome constituents. Likewise, a psychological relationship can link events, outcomes and internal states. In addition, motivational relationships may link goals and attempts. Thus, in varied ways, episode constituents can be connected to one another.

On the surface, Trabasso et al.'s (1989) realization of goal plan constituents (such as 'setting', 'goal', 'attempt', 'reaction', and 'outcome') resembles categories in story grammars. However, the causal connections and roles among constituents in goal plans differentiate them from story grammar categories and make them more characteristic of content than form.

Trabasso and Rodkin (1994) identify the child's ability to infer a goal in relation to narrative events as critical to ensuring narrative coherence. These authors argue that the process of inferring a goal is especially relevant when a child is comprehending a narrative. Furthermore, even when a child is narrating a story based on picture sequences, the child must comprehend the events as well as produce linguistic output. In the process of comprehending pictorial events, the child will need to infer a goal and sustain this inference across events in order to create a coherent story (Trabasso et al, 1992). The inferred goal guides the child's interpretation of all narrative events. In turn, the action in the picture sequences constrains the

child's interpretation (Trabasso & Nickels, 1992).

According to Trabasso and Rodkin (1994), it is the process of inference that serves to link events, goals, attempts, and outcomes into episodes. In particular, a child can infer goals based on the story setting and the events that follow. Actions can then be seen and understood as attempts to accomplish the inferred goal. Finally, outcomes are judged according to whether or not the goal was attained. In this light, goal plan instantiation can be considered an active, cognitively-driven process in which the narrator produces a mental representation of goal-related links across events (Trabasso & Nickels, 1992).

One final consideration is that goal plans may be hierarchical (Trabasso & Rodkin, 1994). Goal-plan hierarchy exists when there is a global goal, which governs or motivates subordinate goals. When there is a hierarchical goal plan, the child narrator must keep the global goal actively encoded over time while addressing subordinate goals. Organizing the goal plan into a hierarchy is mediated by cognitive processes.

Goal plan development.

Recall that in the development of scripts, children advance from a basic script to a more elaborated, flexible, and schematized script. Advances in script development can be attributed to a combination of greater experience and cognitive growth. Let us now consider the development of goal plans, particularly as they are viewed in narrative content.

Initially, children's narratives tend to be descriptions of isolated state changes that are unrelated to goals or to other state changes. Then, they progress to more action-oriented sequences that appear to be temporal rather than causal (Trabasso & Nickels, 1992). With

development, children begin to narrate events in which attempts to achieve a goal are explicitly purposeful. Later still, children include internal states such as thoughts and emotions (Trabasso et al. 1992). Inclusion of internal states represents a child's ability to appreciate internal motivations and is indicative of a level of experiential and cognitive growth.

Bamberg and Damrad-Frye (1991) compared 5-year-old and 9-year-old children and adults' inclusion of evaluative comments in narrative. They rated the following lexical categories as evaluative: 'frames of mind' (which included emotional states, and mental states), 'character speech' (although not strictly evaluative, Bamberg and Damrad-Frye argued character speech was indicative of intentional behaviour on the part of a third person, thus distancing the narrator from the plot-line; note that character speech was marked if a character made a direct statement such as 'The boy said, "Where's my frog?" or if statements were indirect such as 'The boy told the deer to be more careful next time'), 'hedges' (such as 'seems like', 'probably'), 'negative qualifiers', and 'causal connectors' (such as 'because', 'so'). According to Bamberg and Damrad-Frye, inclusion of evaluative elements signals a shift from local action sequences to a global hierarchical perspective, which, in turn, helps ensure narrative coherence. It also indirectly shifts attention from the action to the narrator, providing insight into the narrator's perspective about the action. Results indicated that when narrating, 5-year-olds do include evaluative elements/devices but have no preference as to type. With age, the overall proportion of evaluative elements increased. Moreover, of the five evaluative devices that were coded, 9-year-olds tended to favour the 'frame of mind' evaluative device.

Based on Trabasso et al.'s (1992) and Bamberg and Damrad-Frye's (1991) findings, one could argue that greater coherence results when a child develops a more complete representation or scheme of causal relations and intentional behaviour directed toward goal attainment.

Furthermore, the child must be able to express this goal plan representation in a produced narrative. Expression of causal relationships and intentional behaviour in a narrative signals the narrator's global, hierarchical perspective. This, in turn, enhances narrative coherence.

Cognitive underpinning of event representation.

In order to develop the knowledge of goal plans, a child must have world experience in conjunction with cognitive capabilities. This next section will examine the relationship among world experience, event representation, and cognitive processes.

Cognitive processes are vital to the creation and utilization of event representations. In turn, it is through event representation that we can think and reason i.e., engage cognitive processes in order to make sense out of the world (K. Nelson, 1986a). One such cognitive process that has been identified by Trabasso and his colleagues (Trabasso, Secco, & van den Broek, 1984; Trabasso, van den Broek, and Suh, 1989; Trabasso & Rodkin, 1994) as crucial to the comprehension and production of narratives is inference. In particular, the comprehender or narrator must infer causal connections between events in order to perceive the events as meaningful. A child narrator is able to infer causality based on prior schematization of experience (Trabasso et al., 1984). When a child is able to infer a sustained goal plan across a given set of narrative events, the child is able to produce a coherent narrative. According to Trabasso and Rodkin (1994), the process of inferring a goal plan based on picture story sequences results in linking goal plan constituents (e.g., goals, attempts, outcomes) into episodes through operations in working memory. In addition to inference, the goal plan constituents are united through cognitive operations such as maintenance, access, and retrieval of the goal-plan representation, which is then used, along with other relevant knowledge, to make reasoning judgements about actions and outcomes. The benefit of these

operations is greater efficiency in working memory so that the child can hold more information in the form of a 'chunked' unit (Trabasso & Rodkin, 1994). K. Nelson (1986a) argues that other cognitive processes involved in event representation and indeed all types of representation include pattern analysis and categorization, correlation of co-occurring elements, and sequencing.

K. Nelson (1986a) underscores the importance of the connection between cognitive processes and event representation. She argues that cognitive processes operate on mental representations, not on real world phenomena. When a child perceives an event or experience, the resulting perceptual representation is the first representational form on which cognitive processes may operate. Over time, cognitive operations continue to act on the representation, rendering a more abstract cognitive structure. Greater abstraction then affords the child greater flexibility in thought, making it possible for the child to construct new event representations that are not tied to direct experience. Consequently, the child will be able to perform novel abstract tasks with the same proficiency as commonplace, familiar tasks (K. Nelson, 1986a). However, abstraction is impossible if there is no baseline representation from which to work and construct higher-order cognitive analyses. It is only through previous event representation and its interaction with cognitive processes that a child can construct novel representations of events.

Moreover, the presence of an event representation can influence cognitive performance in the moment. Without an event representation there is no framework from which cognitive processes can operate; therefore, a child may be unable to interpret a given situation or task. K. Nelson (1986a) argues that when no representation exists due to lack of prior experience, a child must try to build a representation 'in the moment' by abstracting whatever features are

available. The effort required to accomplish this may detract from task performance, resulting in task misinterpretation. Even when an event representation is present, if it is not abstract, then a child's ability to flexibly apply the event representation to related or novel areas will be hampered (K. Nelson, 1986a).

It is important to recognize the constraints the initial representation places on subsequent, abstracted representations. K. Nelson (1986a) argues that cognitive operations cannot fill in data that was not originally present. In other words, cognitive processes can refine and abstract the initial representation, but they cannot manufacture missing data. Cognitive processes are further constrained by what a child perceives in the initial representation. Perception is biased. Therefore, what one child perceives from an experience, another child may perceive differently, resulting in a unique perceptual representation. K. Nelson (1986a) underscores the bi-directional constraints between original representation and cognitive operations. According to K. Nelson, to a degree, "the initial perception of an event is constrained by prior knowledge, and the acquisition of new knowledge is constrained by the initial perceptual representation." (K. Nelson, 1986a, p. 7). She concludes that the constraints are not absolute, thus, allowing for change to occur in the system.

## Summary

To summarize, research on narratives has tended to focus on narrative form. This research has included work on linguistic cohesiveness or how sentences are connected in narrative. Cohesive devices encompass linguistic connectives such as 'and' or 'because,' in addition to referential indices in narrative. Another area of research linked to form is investigations of story grammars and story schemata. Story schemata are the mental representations or structures that organize narrative text, independent of particular content, while story grammars

formalize and specify the structures.

Studies of the development of narrative cohesion reveal the interaction of cognitive processes and discourse processes to effect cohesive text. Likewise, in the development of narrative structure, cognitive operations mediate the process. Children pass through various levels or stages as they develop a story schema beginning with description of unrelated events and progressing to narratives in which events are bundled into episodic units that have causal connections. Life experience, including narrative exposure, coupled with advanced cognitive ability, support the development of the story schema.

In contrast with the ubiquitous research on narrative form, relatively less research has focused on narrative content. Narrative content can be seen as arising out of the representation of events. As with narrative schema, young children must be actively engaged in the social and cultural as well as physical environment in order to mentally represent events. Cognitive processes interact with event representations to advance a child's understanding of the world and to enable greater abstraction of the representation.

Scripts are a type of event representation that outline general knowledge about how well-known, stereotypically sequenced events or actions should unfold. Scripts may instantiate causal relations and may be goal-oriented. They can be employed to make inferences about encountered situations in which all information is not explicit. Furthermore, scriptal representations, based on previous experience, enable a child to understand novel situations. Some research indicates scripts may provide the template from which children initially generate and understand narrative events.

Goal plans are even broader psychological or mental representations of related events. Globally, they organize these events in terms of plans to achieve a goal. Local constituent events within a goal plan are linked by causal relations. Other relations that may link constituent events (i.e., initiating event, goal, attempt, and outcome) include enabling, physical, psychological, and motivational relations. When narrating a picture-based story, a child must make inferential judgements about how events are connected in a goal plan in order to produce a coherent narrative.

By instantiating a goal plan representation, a child can both produce and comprehend narratives as an intentional series of events directed towards achieving a goal. Developmental use of the goal plan representation follows a particular progression. Initially, young children do not instantiate goal plans; instead, narrative events are presented or understood as isolated and unrelated. Later, children's representation of event relationships emerges and then progresses from temporal relation only, to inferred goal plan relation, and, subsequently, to explicit goal plan relation. Eventually, children can produce hierarchically-ordered goal plan narratives.

Cognitive processes and operations, in conjunction with world experience, are integral to the event representations that constitute narratives. Lower-order cognitive processes, such as attention and perception, support initial event representation. Moreover, once a juvenile event representation is captured in memory, cognitive processes can be engaged to more fully develop the representation and render it more abstract. A more abstract event representation will then afford the child greater flexibility in thinking and will facilitate comprehension of novel experiences. Thus, advances in cognitive function will enhance narrative construction. In addition, cognitive development will enable a child to grasp the emotional/psychological

components that drive and motivate goal achievement.

Because cognition mediates aspects of narrative form and content, deficits in cognitive processing might impact narrative production. The next section will therefore investigate narrative form and content of children with SLI while considering the influence of cognitive ability on the narrative production of this population.

## Narrative Ability of Children with SLI: Form Vs Content?

Before we can consider the narrative ability of children with SLI, it is important to define this population and to highlight its importance in psycholinguistic research. First, who constitutes this population? Traditionally, children with SLI have been characterized as language impaired while scoring within the normal range on nonverbal tests of intelligence. Leonard (1998) provides a criterion-based definition, the hallmark of which is a language deficit (in which language scores fall –1.25 standard deviations or lower from the mean) juxtaposed with a normal nonverbal IQ (with a performance IQ of 85 or higher). Other indices include hearing, gross neurological function, oral structure, oral motor function, and physical and social interactions all within normal limits.

The profile of specific language impairment offers researchers an opportunity to study the developmental asynchrony between language and cognitive abilities (Johnston, 1997). Furthermore, children with SLI embody 'natural experiments' from which researchers can test theories (Johnston, 1993).

This present study is interested in investigating children with SLI to determine if their world experience, coupled with their cognitive abilities, will enable them to produce coherent

narrative content. A brief overview of children with SLI's narrative-form ability will provide the background from which to pursue the above question.

Form: Cohesion

Narrative production requires, among other things, linguistic knowledge and ability. Because children with language/learning impairment are challenged by linguistic tasks, their stories reflect these linguistic difficulties and differences when compared with the NL population. For example, children with SLI's use of cohesive devices in a narrative differs from that of NL counterparts. In particular, in a narrative production task involving both a naive listener and an informed listener, children with SLI tended to use fewer personal reference ties while using more demonstrative reference and lexical ties than children with NL (Liles, 1985a). In addition, children with SLI demonstrated more incomplete cohesive ties and error ties than NL children (Liles, 1985a, 1985b).

Other studies have investigated narrative cohesion in stories told by children with learning disabilities. Because many who comprise this group tend to have normal nonverbal IQ's and have language-based learning deficits typically affecting reading (Keogh, 1988), they are closely linked to children with SLI, and as such, are relevant to the present discussion. A number of interesting findings emerge from the research. For example, on a narrative retell task, Griffith, Ripich, and Dastoli (1986) found that children with a language learning disability retold stories that contained fewer cohesive devices including fewer pronoun references and conjunctions. Ripich and Griffith (1988) recorded similar findings for this population in a story retell task. Qualitative differences in linguistic complexity measures were also noted for reading disabled children when compared to children with NL (Feagans & Short, 1984). In particular, in a narrative paraphrase task, children with reading disability produced narratives

with fewer words and with more nonreferential pronouns than children with NL.

Form: Story Grammar

Not only are there differences in children with SLI's ability to generate cohesive narratives when compared to NL children, but differences in performance are likewise apparent when measures of story grammar are used. For example, when number of complete episodes (episodes were deemed complete if each of the following were present: initiating event, attempt, and outcome) was measured during a retell task, children with SLI had fewer complete episodes than NL children (Liles, 1987). Similar results (i.e., children with SLI or learning disability produced fewer complete episodes than NL counterparts) occurred in a story generation task (Merritt & Liles, 1987; Roth & Spekman, 1986). Moreover, in both a story generation and story retell task, children with SLI used fewer story grammar constituents than children with NL (Merritt & Liles, 1987). Similarly, Klecan and Kelty (1990) found language-learning disabled children in Grade 4 produced less complex stories (i.e., lacking cause and effect links between character and event) than NL children in the same grade.

Summary

In sum, results indicate children with SLI or language-learning disability have difficulty on both a micro- and macro-linguistic level of narration. In particular, they have difficulties in managing linguistic form in order to produce a cohesive text. Children with language impairment also have difficulty with fully utilizing narrative structure. For example, they include fewer episode and story grammar constituents than their normal language counterparts. One could argue, therefore, that their use of knowledge of narrative form or genre is compromised relative to age peers.

Content

While there is ample research on differences in linguistic measures of narrative performance between children with SLI and NL children, there has been only one study to investigate narrative content differences between the two populations (Gillam, 1989), and this study focused on older children. In his study, Gillam compared narrative content 'action-resolution' pairs for older language impaired and normal language children who were both language- and mental age-matched. Gillam found there were minimal content differences between the language-matched pairs; however, there was a difference between mental age-matched pairs. In particular, the language impaired members told stories with fewer 'action-resolution' pairs than their mental age-matched, normal-language counterparts. However, Gillam's study remains silent as to the narrative content abilities of younger children with SLI.

Research has shown that because of compromised linguistic ability, children with SLI have problems with narrative form but what about narrative content for younger SLI children? Does narrative content remain unaffected so that younger children with SLI can produce a coherent narrative, despite compromised form, or is narrative content compromised as well?

As mentioned previously, cognitive processes, in conjunction with world experience, are necessary to mediate narrative content. If we consider cognitive abilities of the SLI population, it might provide the basis from which to hypothesize about the integrity of narrative content. This will be covered in the next section.

## Cognitive Abilities of Children With SLI

Early investigations of children with SLI assumed normal cognitive ability. However, more recent studies have revealed that although children with SLI score within normal range on

nonverbal intelligence tests, they nonetheless show cognitive deficits in some areas. This section will review some of these findings and begins with a discussion about the interdependence of language and cognition. The discussion then considers how the SLI population is impacted when higher order, verbally mediated cognitive processes are involved and progresses to consider nonverbal, cognitively-based operations that are a) likely to be covertly mediated by language b) likely not mediated by language. The discussion will also consider the impact of particular cognitive processes on narrative production. Studies of children with SLI and their ability to engage in symbolic play will be used to generate a hypothesis regarding this population's ability to produce narrative content. Symbolic play is important to this discussion because, like narrative production, it engages higher order cognitive processes to mediate the child's production and organization of a goal-oriented sequence of play events. In addition, symbolic play shares many features of narrative content structure such as the designation of character roles as well as a departure from the here and now in order to explore make-believe scenarios.

## The Relationship Between Language and Cognition in Narratives

Cognitive processes and language are interdependent faculties that are integral to narratives. Although scientists differ widely in their claims about the sufficiency of general cognitive processes for language acquisition, there is good agreement that cognition supports the organization of input so that children can acquire and control language effectively (Johnston, 1992). Nonverbal cognitive development is one base from which language can emerge. (See Elman, Bates, Johnson, Karmiloff-Smith, Parisi & Plunkett, 1996, for a review of the opposing view that language acquisition is the result of innate, domain-specific mechanisms). Once present, language can then advance cognitive functioning and sophistication (Johnston, 1992). Advanced cognitive processes are consequently able to interact with event representations,

from which narrative content emerges. Specifically, K. Nelson (1986a) argues that advanced or developed cognitive processes impact event representations, resulting in greater abstraction of the event representations. These abstract event representations offer greater inferential power, enabling flexible thought.

What is the consequence to cognitive development when language is impaired? As previously stated, it was once believed that children with specific language impairment had normal cognitive functioning, based on their normal-range performance on nonverbal IQ tests. This might suggest a certain cognitive robustness within the SLI population, in which cognitive processes are impervious to the effects of language deficiencies. However, recent studies have shown that children with SLI do show some areas of cognitive deficit. In the following sections, we will consider the cognitive strengths and weaknesses of children with SLI and how the interaction between cognition and language might impact narrative content.

Cognitive Involvement in Higher-Order, Verbally Mediated Tasks

What is the interaction of cognition and language when tasks involve higher level processing? Johnston (1997) argues that although we cannot conclusively determine language involvement in higher order cognitive tasks, it is reasonable to assume such involvement. According to Johnston, when complex problem solving operations are performed, inner language can economically enhance performance by ordering and summarizing thoughts and by interpreting the physical environment pertinent to the problem. Higher cognitive processes that are mediated by internal verbalization, such as problem solving or reasoning, are important to building narratives. Narrative experiences frequently portray situations in which problems must be solved. Therefore, a child must be adept at such cognitive operations herself in order to produce a satisfying narrative. Because children with SLI are disadvantaged when verbal

activities are involved, we would expect that their performance on verbally mediated cognitive tasks might be similarly negatively affected. This section will address this area of research.

Let us begin with a study that underscores the relationship between higher order, verbally mediated cognitive tasks and language ability. In particular, Restrepo, Swisher, Plante and Vance (1992) investigated the relationship between verbal skills and the nonverbal, language-mediated cognitive skill of rule induction in both language impaired and normal-language children, matched by chronological age. The task they devised required the children to determine the rule indicating which of two containers held a ball. The rule was based on type of container lid, which either had a figure or a colour to make it distinctive from the other lid. The children were told that the lid was the clue to help them make their decision. Correct decisions on six consecutive trials were required in order for the child to be credited with having induced the rule. Both groups had performances on the rule induction task which correlated with a linguistic measure, indicating that cognitive function on this rule induction task was closely related to language function. This provides further proof of the relationship between language and some cognitive processes. What implications do the findings of this study have regarding the ability of children with SLI to produce adequate narrative content? Recall that cognitive processes interact with event representations, upon which a narrator draws to formulate narrative content. Likewise, cognitive processes mediate the formulation of narrative content into a narrative goal-plan structure. Can we therefore conclude, based on Restrepo et al.'s findings, that children with SLI would produce narrative content structure commensurate with their language capabilities? It would be hasty to make such a conclusion because of the cognitive task used in Restrepo et al.'s study. In particular, they used a rule induction task which is not typically required in narrative production. Therefore, making an hypothesis based on this one study would be premature.

Let us now turn to studies involving higher order verbally-mediated cognitive processes which are more likely to be engaged in the narrative task. After the studies are presented, the implications the results of these studies have for narrative content will then be contemplated. First, consider Condino, Im-Humber and Stark's study (1990) in which children with SLI and age-matched NL children performed tasks representative of the problem-solving process. Condino et al. included measures of coding, memory, hypothesis generation, and hypothesis evaluation to encompass the problem-solving process. Results indicate children with NL performed better than children with SLI on all components of the problem-solving process. Children with SLI had particular problems with coding which is not surprising if we normally use words to code. If information is not adequately encoded then all other components of the problem-solving process will suffer. Problem solving and encoding demands are likewise central to Nelson, Kamhi, and Apel's study (1987). In this study, discrimination-learning problems were presented to children with SLI and their mental age-matched NL counterparts. Within trials, the examiner would provide occasional explicit feedback to confirm or disconfirm the child's hypotheses. Whereas NL children did not receive any further benefit from explicit feedback, children with SLI did. This led Nelson et al. to conclude that children with SLI may encode information inefficiently but can be assisted in encoding when their attention is appropriately focused and constrained. If we consider this in terms of linguistic efficiency, children with SLI who lack linguistic structures will neither be able to effectively formulate hypotheses nor analyze their robustness. By providing the SLI children with a language-based coalescence of ideas or the scaffolding on which to synthesize and analyze their mental strategies into a coherent linguistic package, their problem-solving abilities improve.

In addition to problem solving, a narrator, basing a story on pictures, must be able to

comprehend the pictorial presentations and must monitor whether or not there is adequate comprehension so that adjustments can be made if necessary. Ellis Weismer (1985) devised a study to measure comprehension ability of children with language disorder (mean chronological age (CA) 8;4) against language comprehension-matched NL children (mean CA 6;2) and another group of mental age-matched NL children (mean CA 8;3). Ellis Weismer measured comprehension of both true premises and inferences drawn from a verbal and a pictorial version of two short stories. Inferencing proved more difficult for all children on the pictorial task. Overall, there was little difference between the comprehension-matched groups. However, the language disordered group performed less well on inferencing than the cognitively-matched control group. It is reasonable to assume that inferencing is mediated by internal, language-based cognitive processes. Therefore, it is not unexpected that children with SLI would have poorer performance on such a language-mediated cognitive task as inferencing, given that children with SLI are less proficient at language-based activities. Comprehension monitoring can likewise be seen as both a language and a cognitive product. In other words, we can assume that internal language mediates the higher-order cognitive processes needed to self-monitor comprehension. Skarakis-Doyle and Mullin (1990) studied comprehension monitoring of children who were language-disordered. Performance was compared to a comprehension-matched group and to a cognitive level-matched group. Participants were asked to choose one of four pictured geometric shapes. The instructions of which to choose varied from unambiguous to totally ambiguous. Participants were given a model of how to ask for clarification and were encouraged to do so if they needed more information. Results indicate children with language disorder performed similarly to the comprehension level-matched control group whereas the cognitive-level matched control group performed better than both comprehension level-matched groups. Skarakis-Doyle and Mullin conclude that although cognitive input is needed for comprehension monitoring, the

linguistic component may play a larger role. In other words, the internal language needed to mediate the higher order cognitive task of comprehension-monitoring, was likely insufficient for children with SLI to adequately perform the task.

The above studies suggest two interim hypotheses about narrative content production. The Ellis Weismer data indicate that levels of cognitive activity/performance in areas pertinent to narratives may be constrained by language proficiency for older children with SLI. As a set, these studies of higher order thought suggest that narrative content will be 1) consonant with language skills, or at least that 2) it will be, like language, less than would be expected for mental age. Note, however, that none of the cognitive indices used in the studies above capture the full richness and complexity of cognitive involvement in a narrative production task. In other words, although some of the studies do investigate isolated cognitive tasks that could reasonably be expected to be part of narrative production (such as inferencing and problem solving) there are undoubtedly far more cognitive processes involved. Moreover, the cognitive task requirements in the studies do not truly parallel requirements in the production of a narrative. For example, Condino et al. (1990) studied a series of isolated tasks, the sum of which they argued was representative of the problem-solving process. However, it is difficult to say whether this same collection of tasks comprise the problem-solving cognitive process that a child engages when instantiating a narrative goal plan content structure. Likewise, Ellis Weismer (1985) required her participants to draw explicit inferences whereas the inferences a child draws when faced with a picture-based narrative production task are likely to be implicit. Such differences make it difficult to make firm predictions about the effects on narrative content abilities for younger children with SLI, based on the studies of higher order, verbally mediated cognitive tasks presented above.

Cognitive Involvement in Nonverbal, Language-Mediated Tasks

As stated earlier, some cognitive tasks may encourage internal, verbally mediated representations even if such involvement is not absolutely necessary. In these instances, verbal mediation may lead to more efficient, less complex solutions than non-mediated cognitive processes (Johnston, 1994, 1997). The implication for language impaired children is that their performance would be less proficient because their language abilities would be inadequate to augment cognitive processing. This section will review some studies of cognitive tasks that we can reasonably assume favor verbal mediation and will examine the resulting impact on the performance of children with SLI.

In their study comparing the nonverbal cognitive functioning of SLI children with age-matched NL children, Siegel, Lees, Allan, and Bolton (1981) found children with SLI had deficits in tasks of seriation, conservation, spatial order and matching on the basis of internal features rather than border features. Many of the tasks in this study likely resulted in internal, verbal mediation. Thus, it would be expected that children with SLI, deficient in linguistic skills, would have deficient performance on these tasks.

Kamhi (1981) likewise tested younger children with SLI (with a mean age of five years) on a series of nonverbal cognitive tasks. Because the comparison groups he used differ from many other studies of cognitive deficits of children with SLI it bears closer scrutiny. Kamhi compared children with SLI with two comparison groups; one that was language-matched (using MLU as the basis for matching) and one that was mental age-matched using the Leiter test. Tasks included: a classification task of sorting shapes on a number of dimensions; a number conservation task in which the child had to figure out the relative quantity of two displays of checkers; a linear order task in which the child had to arrange objects according to a visible

model of the objects; a water level task in which the child had to draw the water line of a flask that was rotated by different degrees; a haptic recognition task in which the child had to feel a geometric shape and match it to a drawing; and a mental displacement task in which the child had to mentally superimpose two simple geometric forms and choose the right configuration from a choice of four. The only task that resulted in a significant difference among groups was the nonverbal task requiring each child to blindly feel geometric shapes and then choose the correct drawing that corresponded to the shape that was felt. However, in each of the six tasks the pattern of performance difference was the same, i.e., children with SLI performed better than their language-matched counterparts but worse than their mental age-matched control group. We can assume that a number of these tasks, such as classification, or number conservation, were likely mediated by inner language-based cognitive processes. Again, this language mediation would disadvantage the language-impaired children. It is interesting to note, however, that they outperformed their language-matched counterparts, suggesting that their cognitive abilities were, nonetheless, in advance of their linguistic abilities.

Similar to Kamhi (1981), Camarata, Newhoff, and Rugg (1981, 1985) also conducted studies on nonverbal conceptualizations. In both studies, younger children with SLI (aged 3;6-5;6) were MLU-matched with one group of NL children, and age-matched with another group of NL children. One study investigated classification skills in which children were asked to group various geometric forms that differed in shape, colour and size. There were no differences in performance between children with SLI and the MLU-matched control group. However, age-matched NL children performed better than children with SLI, indicating a possible interaction between language and at least some aspects of cognition. In contrast, the second study on perspective taking resulted in children with SLI scoring higher than their MLU-matched counterparts, but scoring lower than the age-matched NL children. As with Kamhi's study, it is

reasonable to assume that the classification task is likely to be mediated by language, leaving the children with SLI at a linguistic disadvantage. The task on perspective taking, however, is likely non-mediated. Results from this second study suggest children with SLI may be deficit in basic cognitive processes responsible for performance on the perspective-taking task, but they nonetheless have cognitive abilities that are not as deficient as their linguistic abilities.

Kamhi's (1981) and Camarata et al's (1985) findings are consonant with the second of the interim hypotheses offered earlier regarding cognitive support of narrative content in SLI children. The cognitive development of children with SLI evident in these studies is such that it should result in narrative content in advance of linguistic skill, albeit less than might be expected for age. Let's now consider how strong a hypothesis can be formulated based on Kamhi and Camarata et al.'s findings. Camarata et al.'s results were based on matching by chronological age (CA), so any hypothesis is constrained by that condition and therefore must be based on matching by CA. On the other hand, Kamhi matched his subjects by mental age (MA). Can his findings be confidently used to predict narrative content performance of children with SLI who are MA-matched with NL children? Note that Kamhi used the Leiter test of IQ to determine mental age. Johnston (1982b) analyzed this test and determined that when it is used for children ages 3 to 7 (the age range pertinent to Kamhi's study), it tends to test cognitive skills which are not verbally mediated. Because narrative content production is likely to be a language-mediated cognitive task, it would be difficult to make firm predications about narrative content performance of mental age-matched children with SLI, based on studies in which mental age was determined using nonverbally mediated cognitive indices.

Cognitive Involvement in Nonverbal, Non-Mediated Tasks

When language is impaired, it can hamper learning and cause some delay in cognitive

advancement (e.g., Johnston, 1997; de Ajuriaguerra, Jaeggi, Guignard, Kocher, Maquard, Roth, & Schmid, 1976) which can, in turn, affect narrative ability. In the previous sections, we have had evidence of how children with SLI are at a cognitive disadvantage in instances where cognitive processing should be enhanced by language mediation. Yet, there has also been evidence of some cognitive strengths. In particular, while children with SLI tend to perform less well than their mental age-matched counterparts, at times they nonetheless outperform their language-matched NL counterparts. We can conclude that, despite their language deficit, children with SLI have cognitive competencies in advance of their language. However, is their relative cognitive competency sufficient for them to produce coherent narrative content? Recall that event representations, initially derived from non-mediated cognitive processes, are necessary for narrative content. As a child develops, abstraction of event representations is made possible by advanced cognitive operations, which are, in turn, enhanced by language-based, mental operations. However, for younger, developmentally immature SLI children, do they possess an adequate enough base of cognitive processes so that they can produce causally connected narrative event representations and thus, coherent narrative content? In order to more clearly respond to this question, let us now consider the non-mediated, cognitive abilities of children with SLI.

Research indicates that cognitive impairment extends to nonverbal functions i.e., cognitive functions that are not mediated by 'internal' language (Johnston, 1992). For example, Johnston and Ellis Weismer (1983) had children with SLI and a control group participate in a visual imagery task that required mental rotation of a geometric array in order to judge if it was the same as an adjacent, upright array. Results indicated children with SLI were slower in making their judgements than the age-matched controls. That both groups took longer to make a judgement as the degree of required mental rotation increased, indicates that

nonverbal imagery rather than verbal processing mediated completion of the task. Johnston and Ramstad (1983) likewise found evidence of cognitive deficits in high-imagery, low-verbal tasks in a study of older children with SLI.

In her unpublished doctoral dissertation, Riddle (1992, cited by Johnston, 1997) provides further evidence of non-language-mediated cognitive deficits. Under a dual-task paradigm, Riddle had 4- and 5- year old children with language impairment and their chronological age-matched NL counterparts perform an auditory detection task during a visual classification task. There were three stages to the visual classification task: 1) the slide presentation of a visual alerting signal, 2) the slide presentation of the target (a basic category item such as a dog), and 3) the slide presentation of the response choices (one of which was a member of the same basic category and the other of which was from a different category, e.g., a dog and an apple). Children were to choose the same category item as the target by pushing a button on the corresponding side of the screen. The auditory detection task was introduced during a random half of the classification trials. The auditory detection task, consisting of a buzzer, occurred during one of the three stages of the classification task. When the children heard the buzzer, they were to press a button to stop the buzzer as soon as possible while continuing to perform the classification task. Auditory reaction times during the dual task presentation were measured against baseline reaction times. Results indicated that the younger SLI children had longer reaction times during stage one (the alerting stage) and stage two (the encoding stage) than the NL counterparts. If we consider this in terms of attentional capacity, we can infer that slower reaction times indicate high classification task demands that take up most of the attentional capacity with little to spare for the auditory detection task (Johnston, 1997).

In order to determine if the younger children with SLI were using a visual or verbal coding

system in the classification task, Riddle made the target and correct-response picture identical in half the trials. In the other half of the trials, the two pictures were different exemplars of the same basic category (e.g. a collie and a German shepherd dog). It was reasoned that if the response accuracy were the same for both sets of trials, then the children were using a verbal code to encode the target. Interestingly, the children with SLI were more accurate when the pictures were identical, whereas the NL children showed no response accuracy differences across the two sets of trials. This suggests the children with SLI tended to use a visual rather than verbal code (Johnston, 1997).

From this research, we can see some cognitive strengths. In particular, children with SLI are able to access other modes of representation such as visual representation, particularly at earlier stages of development when higher abstract themes are not expected. Nonetheless, the above studies clearly indicate that children with SLI also have some cognitive deficits in areas not mediated by language. In particular, children with SLI require more time to complete visual imaging tasks than their age-matched NL counterparts and their reaction times are likewise greater than CA-matched NL children when asked to perform dual tasks involving auditory detection and visual classification.

Evidence of Processing Problems

What can account for cognitive delays or deficits? It seems reasonable to expect delays in cognitive ability when the cognitive processes are mediated by internal language. This does not, however, satisfactorily account for cognitive deficits in which verbal mediation does not occur. For answers, we must look to evidence of processing problems. As revealed in Riddle's study (1992, cited by Johnston, 1997), limited attentional capacity was responsible for the response delays in the younger children with SLI. Johnston (1997) argues that these

children with SLI experienced reduced attentional capacity because of visual encoding, which, at least in this instance, was less efficient than verbal encoding. In other words, the visual code could not solve the problem for the non-identical items, necessitating an additional, later coding step. Let's now consider further research that supports the theory of processing problems in children with SLI.

Johnston and Smith's study (1989) likewise illustrates the effects of information processing limitations on children with SLI. Children with SLI aged 3;6 –5;9 were mental age-matched with NL controls. The children participated in a 'follow the leader' game with two experimenters. First one experimenter chose one or two items from an array of three (e.g. two green houses of different sizes in which the third item in the array was a small blue house). Then the second examiner, possessing items from a different array, would choose items to confirm the first examiner's choice (e.g., two red houses of different sizes from an array in which the third item was a large yellow house). Finally, the child was invited to make a selection from an array that differed from the first two. The child made an accurate choice if the child's selection retained the same attribute as the examiners' selection. Not only did the task vary along attribute dimensions, (e.g., colour, size, and shape) but the task also varied as to whether the child could rely on explicit verbal instructions (e.g. "pick the ones with the same colour") in addition to observing the examiners' choices, or whether the child had to rely exclusively on the nonverbal choices both examiners made. Results indicated that there were no group differences on the verbal task. However, children with SLI had difficulties with the nonverbal task entailing size. Johnston and Smith argue that the size task had greater processing demands because it required children to make ordinal judgements. Johnston and Smith further argue that this finding supports the view that children with SLI have greater processing capacity limitations than children with NL because their use of available knowledge

seemed to be hampered when processing demands were higher.

Leonard (1998) in his exploration of perceptual deficits in children with SLI, states it is a common finding that "children with SLI perform quite poorly on tasks requiring the processing of brief stimuli and the processing of stimuli that are represented in rapid succession" (Leonard, 1998, pp. 273-274).

In addition to children with SLI suffering from perceptual deficits, Johnston (1997) argues that other processing deficits may be attributed to slow or inefficient processing which may tax available resources.

In sum, a variety of processing difficulties that include perceptual, as well as attentional deficits, capacity limitations, and slow processing, may individually or in combination, account for why children with SLI have cognitive deficits in the nonverbal domain.

Integrity of Cognitive Functioning in Children with SLI

Although some nonverbal cognitive processes have been shown to be deficient in children with SLI, other cognitive processes, not mediated by language, may remain intact. For example, Donlan, Bishop, & Hitch (1993) devised a task of relative size judgements involving numeral comparisons, dot matrix comparisons, line-drawn animal size-comparisons, and size comparisons of line-drawn houses. Donlan et al. found that younger children with SLI, aged 6-8, tended to outperform a control group of NL children who were matched on verbal comprehension (although the trend was nonsignificant). In addition, their performance closely matched performance predictions based on age and nonverbal ability. Their findings led Donlan et al. to conclude that verbal processing does not appear to play a key role in mediating

comparative number judgements. Furthermore, they posited the symbolic representational skills required for this task are intact in children with SLI. An additional factor, beyond Donlan et al.'s arguments, may account for the SLI group's success on this task. It could be argued that theirs was a visual perceptual judgement task with low on-line demands, i.e., stimuli remain available for repeated scanning etc.

What might be the implications of the above study on the narrative content abilities of children with SLI? Production of narrative content is a complex task requiring the instantiation of a number of event representations woven together in a narrative goal plan structure. Processing demands for this task would be high. However, as illustrated in Donlan et al.'s study (1993), processing demands for children with SLI can be reduced if these children have visual stimuli (e.g., pictures) available to support the initial instantiation and subsequent re-instantiation of event representations and narrative goal plan structure.

Summary

To summarize, there is an interdependence between cognition and language. Cognitive development provides the foundation for language acquisition but language also enhances further cognitive advancement. Thus, it is not surprising to find that children with SLI, especially those who are older, have cognitive deficits in verbally mediated tasks. As a child ages, language develops more fully and interacts with cognitive processes, creating more abstract event representations and affording the child greater flexibility in using them. As a child with SLI ages, language development does not keep pace, resulting in less abstract event representations. Consequently, children with SLI who are older will be disadvantaged on cognitive tasks mediated by language and they will not be able to perform at the same level as their NL age-matched peers.

Likewise, there is also evidence that children with SLI have cognitive deficits in processing domains not mediated by language. There is a body of research which suggests that cognitive deficits, regardless of language mediation, may be traced to processing problems. In particular, deficits in attention and perception, as well as reduced information-processing capacity, and slow, inefficient processing may all account for cognitive deficits in the heterogeneous SLI population.

Despite evidence of cognitive deficits in children with SLI, there is also evidence of intact cognitive ability. Indeed, children with SLI score within the normal range on nonverbal intelligence tests. This is indicative of at least some intact cognitive processes. Moreover, K. Nelson (1986b) argues that some children have the requisite knowledge but lack the ability to flexibly transfer knowledge of one event situation to another, depending on the level of abstraction of their existing general event representation. Thus, some children will perform less well in a decontextualized setting, such as formal testing of cognitive ability, but will nonetheless possess the representation necessary to perform the cognitive operations in a more context-rich environment. This may be especially true for older children with SLI. Although they have the requisite cognitive ability and general event representations as a result of their world experience, they may not be able to effectively utilize them in a formal test environment because they cannot effectively transfer this knowledge to the situation at hand.

In addition, children with SLI evidence the cognitive ability to construct mental representations in modes other than verbal (e.g., the visual mode). These alternative representations can prove effective especially for younger children for whom abstract representations are not yet expected.

How might studies on the cognitive abilities of children with SLI inform our exploration of the narrative content abilities of these children? Two interim hypotheses have been proposed based on research of higher order cognitive functioning of this population compared with NL children. These hypotheses are as follows: 1) narrative content production will be consonant with language skills or 2) it will be, like language, less than would be expected for mental age. The second of these hypotheses has gained further support from research comparing language-mediated cognitive functioning between SLI groups and NL groups of children. However, it is important to remember the limitations of such research in making firm predictions about narrative content performance of children with SLI. In particular, some of the researched cognitive functions bear little resemblance to those required in the narrative content production task. It is therefore difficult to make strong predictions of children with SLI's narrative content ability, based on these studies. Likewise, when calculating mental age, some researchers used a test that measured non-verbally mediated cognitive function instead of verbally-mediated cognitive function, which parallels the cognitive functioning required for narrative production. Once again, it is difficult to make predictions of mental age-matched SLI children's narrative content ability when the test of mental age does not measure the kind of cognitive processes (i.e., verbally mediated) required in the narrative content production task. Finally, some findings were based on studies of older children with SLI who were MA-matched with NL counterparts. Again, predictions of narrative content performance of younger SLI children, based on studies of older SLI children, would be difficult to make.

Let's now consider research on symbolic play as a means to make reasonable hypotheses about the narrative content ability of children with SLI. Symbolic play is relevant to the production of narrative content because the two activities share many features. In other words,

there are a number of parallels between symbolic play and narrative content structure. For example, both represent events and both may be constructed from script-based event representations or a goal plan frame. Both may be concerned with intentional acts leading to an outcome. Both require a level of higher order cognitive development in order to mediate the activity. Based on the similarities between narratives and symbolic play, the next section will closely examine and utilize research in symbolic play to make predictions about narrative content abilities in children with SLI.

Cognitive Processes in Symbolic Play of Children with SLI: A Window to Narrative Content?

With the exception of one study of older SLI children (i.e., Gillam, 1989), there has been no research on narrative content abilities of young children with SLI. As previously stated, there are parallels between symbolic play and narrative content. Additional similarities between narrative content and symbolic play include the use of characters who fulfill roles. Symbolic play and narrative content may both involve fantasy. Both activities require the participants to step out of the reality of 'here and now' (Westby, 1984). It is therefore interesting to look at research on symbolic play abilities of children with SLI and use it to make predictions about narrative content abilities of children with SLI.

Terrell, Schwartz, Prelock, and Messick (1984) provide illustrative research on symbolic play. They compared SLI children with language-matched NL children. Using the Symbolic Play Test, they found children with SLI were in advance of their language-matched counterparts. Terrell et al. argue that because the language-matched children with SLI were older than their NL counterparts, the children with SLI had more experience with objects and their uses and thus had greater flexibility in play activities. However, when compared to age norms, children with SLI were less advanced in their play skills. Terrell et al. conclude that cognitive

processes, which mediate symbolic play, may be influenced by language. In particular, they argue there is a possible reciprocal relationship between language and cognitive development such that when language is impaired, it may somewhat hamper cognitive growth. According to Terrell et al., because children with SLI have linguistic deficits, these children have less well-developed cognitive underpinning which affects symbolic play. Thus, their symbolic play ability is less well-developed than their age-matched NL counterparts.

What implications does research on symbolic play have for the narrative content abilities of children with SLI? Based on the above research, we can predict children with SLI will have both cognitive strengths and weaknesses that may affect narrative content. Recall children with SLI have cognitive strengths sufficient to facilitate symbolic play in advance of their language-matched, NL peers. Based on this finding and other general research citing cognitive strengths in younger children with SLI (e.g., Kamhi, 1981), we can expect these children to possess cognitive abilities, needed to construct narrative content goal plans, in advance of their language-matched, NL counterparts. Similar to Terrel et al.'s findings (1984), it is reasonable to argue that the resulting age differences when younger children with SLI are language-matched with NL children will advantage the SLI group. In particular, we can expect this group to be older than the NL group and therefore to have greater world experience and greater cognitive development mediating the enhancement of event representations and the instantiation of goal plan structures. Furthermore, younger children, whether SLI or NL, will likely have less abstracted event representations, and as such, language should have less of an impact. Nonetheless, we can expect younger language-matched SLI children will have more abstract event representations than their NL counterparts which will serve them in formulating more advanced narrative content. Indeed, the summary effect of the above-listed advantages should result in more developed narrative content for the children with SLI

compared with their language-matched counterparts. Presumably, children with SLI use alternate visual representational abilities that can advance them somewhat beyond their language limitations. This may also advantage children with SLI when they are constructing representations that will be engaged in narrative content.

As other research presented in this chapter indicates, children with SLI also have cognitive deficits. If, however, we were to match this group with NL children by mental age, using a nonverbal, linguistically-mediated test to measure mental age, we would expect cognitive equivalency on language-mediated cognitive tasks. If these groups were judged to be cognitively equivalent in such a manner, then narrative content, resulting from language-mediated, cognitively-based goal plan representations, should be equivalent as well.

## Summary

The above review illuminates the value of studying SLI children's narrative content ability in the face of compromised narrative form. Narrative form emerges from linguistic ability while content emerges from event knowledge based on world experience. Event knowledge is manifested in event representations. As a child develops, cognitive processes operate on event representations, resulting in greater abstraction in which cause-effect relationships become specified. In a narrative context, this conceptualization provides a goal plan structure from which to build a coherent narrative.

In normally developing children there is synchronized development of the various knowledge domains from which narrative form and content emerge. However, in children with SLI, some knowledge domains develop in an asynchronous pattern. For example, language, by definition, develops more slowly than some other aspects of cognition. This asynchrony can

be expected to affect narrative production. Many studies report, as expected, that the linguistic deficits of children with SLI impact narrative form. However, to date, with one exception, there has been no research on narrative content ability of children with SLI. Remembering that narrative content is supported initially by world experience of events which is then captured in memory as event representations and further refined by cognitive processes, we can hypothesize on the nature of narrative content of children with SLI by considering their level of experience and cognitive development. Research on symbolic play, shown to have parallels with narrative content structure, will facilitate hypothesis formation.

Studies indicate that children with SLI have cognitive strengths as well as weaknesses. Cognitive deficits include attention and perception difficulties, reduced processing capacity, slow or inefficient processing in addition to deficits in higher order, linguistically mediated cognitive operations. Cognitive strengths are suggested by the normal scores children with SLI achieve on nonverbal IQ tests. Research likewise indicates that in many instances, children with SLI have cognitive abilities in advance of their language skills. Children with SLI have also been shown to have certain cognitive abilities which may not be manifest when additional processing demands are brought to bear. Finally, these children might use alternate visual representations to assist them beyond their language limitations. Given the cognitive strengths and sufficient world experience to support cognitive development, children with SLI may be able to produce content structure that is in advance of narrative form abilities. Research on symbolic play supports this argument. On the other hand, since SLI children lack language proficiencies that may be crucial in the development of higher level narrative schemes, they may be unable to produce narratives that are at the level of their age peers. Instead, their narrative content would be in line with performance on other linguistically mediated cognitive tasks. These predictions need to be tested.

## Statement of Research Hypotheses

The present study addresses the absence of research on narrative content structure of children with SLI. Given the interdependence of language and cognition and given the various cognitive strengths and weaknesses that children with SLI have in the face of language deficits, do younger children with SLI have sufficient cognitive development to produce causally connected, goal plan structured narrative content? The following hypotheses were designed to provide some insight into the narrative content structure of younger children with SLI.

1) It is hypothesized that narrative content structure of younger children with SLI will be in advance of MLU-matched children with NL.

2) It is hypothesized that narrative content structure of younger children with SLI will be equivalent to mental age-matched NL children.

Chapter Two will outline the method used to test these hypotheses.

# Chapter 2

# METHOD AND CODING TAXONOMY

## Overview

The purpose of this study was to investigate the narrative content abilities of children with specific language impairment (SLI) as compared to children with normal language (NL). Narrative content is based on event representations, which are, in turn, constructed from world knowledge. Cognitive processes mediate the development and refinement of event representations. As children age, they typically gain further experience with events in the world. Concomitant advances in children's cognitive development result in more conceptualized and abstract event representations. Likewise, subvocal verbal mediation of cognitive processes can further enhance the conceptualization of event representations instantiated in narrative content. This increases the likelihood of coherent narrative content. However, for children with SLI, this process of developing conceptualized, abstract event representations, necessary for coherent narrative content, could be compromised. In particular, recent studies have uncovered some cognitive deficits in this population, despite normal performance on nonverbal IQ tests. Johnston (1992, 1994, 1997) has argued that given the interdependence of language and cognition, it is not surprising that children with SLI, who are deficient in language, would have some cognitive consequences. If verbal mediation of cognitive processes were compromised, as expected in the SLI population, then one would likewise expect event representations, instantiated in narrative content, to be less conceptualized, perhaps to the extent that narrative coherence would be jeopardized. However, it is important to recall that children with SLI also have some cognitive strengths. For example, Kamhi, (1981) has provided evidence that children with SLI perform some cognitive tasks in advance of their language abilities. Are these cognitive strengths sufficient to ensure children with SLI will produce narrative content in advance of their language-matched, NL

counterparts, especially given that the language-matched children with SLI will be older and likely to have greater world knowledge? Study One was designed to investigate that question. Study Two was designed to test the narrative content abilities of children with SLI who were mental age-matched with NL children. It was reasoned that if these two populations were cognitively matched using a verbally mediated cognitive task, then narrative content ability should be equivalent, given that event representations constituting narrative content are supported by verbally mediated cognitive processes.

This chapter will outline participant characteristics, the narrative task procedure, the narrative analysis, and, finally, the coding scheme used to determine the level of narrative content structure for Study One and Two participants.

## Study One

Participants included children with SLI who were language-matched with NL children. Two sets of line-drawn picture cards were used to elicit two separate narratives. (Hickmann, Hendriks, Roland, & Liang ,1996, and Hickmann, in press, also used these line drawings for narrative elicitation in previous studies). One set of picture cards depicted a horse as the protagonist while the other set depicted a cat as the protagonist. Narratives elicited from these picture cards will, herein, be referred to as the Horse story and the Cat story, respectively. Elicited narratives were tape recorded then transcribed, following which, they underwent content analysis and then were scored using a developmental stage scale described later in this chapter.

### Subjects.

Participants were drawn from a larger cross-linguistic morphology study. Selection of

participants was made so as to ensure a maximum range of MLU in words (MLU-W) while capturing a broad age range. A maximum MLU and age range was sought so as to help ensure a truly representative sample of the SLI population as well as to ensure a representative range of stories. Otherwise, selection was random. All participants came from families whose primary language was English. Moreover, participants had no history of hearing impairment. IQ was measured using the Columbia Mental Maturity Scale (Burgemeister, Hollander Blum, & Lorge, 1972) or the McCarthy Scales of Children's Abilities (McCarthy, 1972). All participants performed within normal IQ range i.e., 80-120. Ten children with SLI participated. Eight were male and two were female and ranged in age from 4 to 6 years. The mean age was 5;9. All SLI participants had Developmental Sentence Analysis (DSS) (Lee, 1974) scores below the 10$^{th}$ percentile. The ten remaining participants were children with NL who were MLU-W matched with the SLI children. The children with NL ranged in age from 2 to 4 years. The mean age was 3;4. Six of these children were female and 4 were male. All NL participants had DSS scores between the 10$^{th}$ and 90$^{th}$ percentiles.

MLU-W data characteristics.

MLU-W was determined from a spontaneous language sample collected as part of the larger cross-linguistic morphology study. The language sample from which MLU-W values were derived contained approximately 25-30% of narrative text (e.g. personal narrative, story telling using picture books, etc.), the remainder being play-based conversation.

It is important to note that the above described language sample from which MLU-W was calculated has rendered MLU values that may not have face-value equivalence with MLU values derived from studies not applying this method. In particular, including a portion of narrative text in the sample may have rendered MLU values which differ from those derived

strictly from conversation-based language samples.

MLU-W versus MLU-M.

MLU-W was used as a measure of language competency instead of MLU-in-morphemes (MLU-M). MLU-M is a more discriminating measure than MLU-W in that it includes bound morphemes in addition to lexical and syntactic free-standing units. However, because children with SLI are known to have problems with bound morphemes, they will tend to have MLU-M values that are lower than MLU-W values relative to their normally developing peers. The intent of matching by MLU in Study One was to establish general language ability rather than establishing an index from which to measure particular language differences. Thus, the more general measure (i.e., MLU-W), which ignored the bound morpheme problem typical of children with SLI, was used.

Description of MLU-W matched pairs.

MLU-W measures differed by no greater than 0.30 between each member of an MLU-W matched pair. The first five pairs had MLU-W values ranging from 2.27 to 3.35. For descriptive purposes, MLU-W matched pairs within this range will herein be referred to as the lower MLU group. MLU-W pairs that had MLU values above that range will be referred to as the higher MLU group. Note that within the lower MLU group, children with SLI had slightly lower MLU-W values than their NL counterparts. However, in 4 out of 5 pairs within the higher MLU group, children with SLI had slightly higher MLU values than their NL counterparts. Nonetheless, there were no statistical differences in MLU-W values between the NL and SLI groups (mean SLI MLU-W value:3.56; mean NL MLU-W value: 3.65; $t = 0.22$; df = 18; $p>.1$). In all instances, children with SLI within the MLU-W matched pairs were older than their NL counterparts. Because of MLU-W matching, children with SLI had, on average, a statistically significant 29

month advantage over the NL group (mean SLI age in months: 69.1; mean NL age in months: 40.2; $t = 6.11$; df = 18; $p<.005$).

A summary of Study One participant characteristics is presented in Table 1 below.

Table 1

Study One Participant Characteristics

| Subject NL | Age in Months | Gender | MLU-W | Subject SLI | Age in Months | Gender | MLU-W |
|---|---|---|---|---|---|---|---|
| 1 VM2N | 30 | F | 2.49 | 1 KB5I | 68 | M | 2.27 |
| 2 LC2N | 34 | M | 2.64 | 2 AB6I | 73 | M | 2.51 |
| 3 AB2N | 29 | F | 2.91 | 3 JOH5I | 63 | M | 2.78 |
| 4 CE3N | 38 | F | 3.30 | 4 JM4I | 53 | M | 3.00 |
| 5 JH2N | 31 | M | 3.35 | 5 JC6I | 82 | M | 3.08 |
| 6 MR2N | 30 | M | 3.72 | 6 BB5I | 69 | M | 3.81 |
| 7 YW4N | 54 | F | 3.82 | 7 GB6I | 84 | M | 3.92 |
| 8 CB3N | 47 | M | 4.34 | 8 JD4I | 57 | F | 4.44 |
| 9 AP4N | 55 | F | 4.88 | 9 BC6I | 76 | F | 4.91 |
| 10 MW4N | 54 | F | 5.09 | 10 RT5I | 66 | M | 4.92 |

## Study Two

A second study was also conducted which mental age (MA) -matched the 5- and 6-year-olds from the SLI group in Study One with a new NL group. Participants were matched by mental age with the expectation that cognitive ability and world experience would be similar within pairs. It was reasoned that establishing equivalence in mental age would result in equivalent narrative content. The same procedure and line-drawn picture cards from Study One were used in Study Two.

### Subjects.

Data from the 5 and 6 year old children with SLI (eight in total) in Study One were used for Study Two. Seven of the eight participants with NL were drawn from a suburban, middle class, primarily Caucasian neighbourhood in Saskatoon, Saskatchewan, a prairie community. The eighth participant was drawn from a multicultural elementary school in Burnaby, British Columbia. Four of the children with NL were female, and 4 were male. NL participants had no history of language impairment and cognitive and motor skills were developing normally as well. Criteria for selection of NL participants remained the same as in Study One, i.e., the primary language at home was English, the children had no history of hearing impairment, and IQ, measured using the Columbia Mental Maturity Scale (Burgemeister et al., 1972) was within normal range. MA was calculated by multiplying IQ (obtained from the results of the Columbia Mental Maturity Scale) by chronological age in months and dividing the product by 100. In all but one pair, MA was slightly higher for the NL member of the pair than the LI member of the pair. In 7 of the 8 pairs, mental age differed by no more than 4 months. The remaining pair differed by 10 months, i.e., the NL member had a MA of 91 compared to the SLI member's MA of 81. The mean MA difference between the two groups was not statistically significant (mean MA for NL group: 72.38; mean MA for SLI group: 69.75; $t = .69$; df = 14; $p > .1$).

A summary of Study Two participant characteristics is presented below.

Table 2

Study 2 Participant Characteristics

| Subject NL | Gender | Mental Age | Subject SLI | Gender | Mental Age |
|---|---|---|---|---|---|
| LO6N | F | 64 | RT5I | M | 62 |
| CP5N | M | 64 | JOH5I | M | 67 |
| MD5N | F | 67 | KB5I | M | 65 |
| DP5N | M | 70 | AB6I | M | 69 |
| BC5N | F | 72 | BB5I | M | 68 |
| DK6N | M | 73 | BC6I | F | 71 |
| NH5N | F | 78 | GB6I | M | 75 |
| JW6N | M | 91 | JC6I | M | 81 |

## Procedure

The next section will describe the narrative elicitation and transcription procedure used in Study One and Two and will then outline the analysis of the story content including the developmental narrative stage scheme.

### Narrative Elicitation, Transcription Procedure and Criteria for Choosing 1st or 2nd Telling

For Study One participants and SLI participants in Study Two, narrative samples elicited from

the Horse story cards and the Cat story cards were gathered as part of a larger cross-linguistic morphology study that included a battery of tests and a spontaneous language sample. Narrative samples were tape-recorded in a home, school, preschool or clinic setting. Narrative samples for the NL participants in Study Two were collected in the home setting. Each child was seen individually. The procedure for narrative elicitation began with the examiner explaining to the child that a story telling game was about to ensue. The examiner followed a script which stated that the child and examiner would look at story pictures that would be kept secret from a blindfolded puppet. The child was then asked to blindfold the puppet. Next, the examiner displayed the pictures in a predetermined out-of-sequence order and configuration. The Horse story cards, numbering five in total, were presented first. The second card in the sequence was displayed first, followed by card numbers 3, 4, 5 and 1. In addition, the cards were staggered so that cards 2, 4, and 1 were lower while cards 3 and 5 were higher. The child was instructed that the cards were mixed up. The child was then invited to rearrange the cards so as to make the best story. Once the child was finished, the examiner recorded the order on paper. If the cards were not sequenced in a standard order the examiner would then put them in proper sequence explaining that this was another way to make a story and it was now time to tell the puppet the story as it was presently arranged. The child was encouraged to tell the whole story and was told that afterward, it would be the puppet's turn to retell the story. The child was reminded that the puppet was blindfolded and might have some difficulty retelling the story and, therefore, might need some help. The child was then invited to begin the story. If the child was reticent to begin, the puppet was permitted to say 'How does the story begin?' or 'What's the story about?' or 'What happened'. If the child had difficulty narrating or was hesitant to continue, the examiner was allowed to offer interventions. These could include repeating what the child said with a rising intonation so as to encourage the child to continue or using more explicit prompts such as 'tell me more' or 'then what happened'. If

such general prompts were ineffective in encouraging the child to continue, the examiner was permitted to progress to more specific intervention such as 'Who else is in the story?' 'What else did X say/do?' if necessary. However, the examiner was encouraged to keep the interventions to a minimum and to revert to less specific intervention as soon as possible to ensure the narrative was child-directed and generated. In other words, the examiner was careful to ensure the narrative was of the child's own making, minimally influenced by the examiner. Once the child completed the story, the puppet was asked to retell the story. However, the puppet, having a bad memory, could not recount the story and, therefore, always asked the children to tell the story one more time with the proviso that the puppet would listen really hard this time and would try equally hard to remember the story. This afforded the children another opportunity to more fully develop their stories. At this point, the examiner again emphasized the need to tell the whole story really well. If the child failed to include certain information in the first or second telling of the narrative, then the examiner asked certain, specified questions at the end of the child's final narration. This would allow the child an opportunity to explain certain events in the story not clarified in the original narratives. The questions asked at the end of the Horse story were as follows.

> "Why did the horse jump over the fence?"
> "What are the cow and the bird doing at the end of the story?"
> "How does the horse feel at the end of the story?"

The puppet was then asked to try once again to tell the story and the puppet responded by reconstructing, as accurately as possible, the child's story.

The same procedure was followed for the Cat story with the following exceptions. The Cat story was depicted on six cards. The examiner initially laid out only four cards. They were laid out in such a manner that sequenced card #2 was above card # 5 then to the right of that column, card # 6 was placed above card # 4, forming another column. Once the child

arranged these cards in left to right fashion, the examiner gave the child card # 3 and then card #1 to be placed in sequence with the other cards. Once again, if the child did not arrange the cards in the standard sequence, they were rearranged in correct order and the child was invited to tell *that* version of the story. If the child failed to include certain information in the narrative, the examiner then asked the following questions once the child completed the Cat story.

"Why did the mother bird fly away?"
"What is the mother bird doing there?" (Card #2, 'flying away')
"Why did the cat climb up the tree?"
"Why did the dog bite the cat's tail?"

The tape-recorded narratives were then transcribed using Systematic Analysis of Language Transcripts (SALT) (Miller & Chapman, 1996) transcription conventions. Transcription accuracy was verified using a second transcriber. A third checker was used to settle any unresolved transcription disagreements.

It was decided that only one telling of each story would be scored. Choosing the first or second telling for scoring was guided by goal plan elements (Trabasso et al, 1992; Trabasso & Nickels, 1992; Trabasso & Rodkin, 1994). In other words, preference was given to the telling that included initiating events and goals as well as attempts and outcomes. Of these goal plan elements, the presence of an initiating event and goal was deemed most crucial. Therefore, a particular telling of a narrative was favoured over the other telling if it contained an initiating event and goal whereas the other did not. All other things being equal, preference was given to the telling that contained the most complete (in terms of goal plan constituents) secondary episodes (bird and cow in the Horse story, and bird and dog in the Cat story). For stories that lacked goal plan constituents, preference was given to those stories whose narrated sequence of events most closely resembled the picture sequence or depicted a logical sequence of

events. Moreover, preference was given to the story that contained specific labels for crucial content such as the characters, and objects and actions in the story. For example, in the Horse story preference was given to the telling that had specific reference to the fence and/or the horse jumping over it, while in the Cat story, the telling that included specific reference to the tree and/or the cat climbing it was preferred. In the event that there was little discrepancy between the first and second telling, the first telling was chosen. Among the NL group's versions of the Horse story (Study One), the first telling was chosen in 7 out of 10 instances. Among versions narrated by the SLI group, the first telling was chosen in 6 out of 10 instances. For the Cat story (Study One), the first telling was chosen in 4 out of 10 instances among the NL group's versions. However, note that, in 4 other instances, only one version was available because the children refused to tell the Cat story twice. The second telling was chosen in the remaining 2 instances. Among the SLI group's versions of the Cat story, the first telling was chosen in 4 instances, and the second telling was chosen for the remaining 6. Among the NL group's versions of the Horse story in Study Two, the first telling was chosen in 3 of 8 instances while the second telling was chosen in the remaining 5 instances. Among the SLI group's versions of the same story, the first telling was chosen in 5 instances, the remaining 3 were the second telling. Among the NL group narrating the Cat story (Study Two) the first telling was chosen in the 3 out of 8 instances, the remainder being the second telling. Among the SLI group narrating the Cat story in Study Two, the first telling was chosen in 5 out of 8 instances, the remainder being the second telling.

Raw transcription data for the chosen story were edited so as to highlight the narrative content, free from extraneous material. Extraneous material such as permissible examiner prompts (e.g., 'and then what happened?' 'Uh huh') was removed, leaving only the child's responses and utterances to form the body of narrative content. The edited version which underwent

content structure analysis will herein be referred to as the 'story'. The edited version began at the child's description of the first picture and ended with the description of the last picture. It did not include post narrative questioning such as "Why did the horse jump over the fence". These questions and the child's responses were included separately in a section designated 'examiner's questions' and were not considered in the content analysis. However, when the examiner asked the child to clarify a point, typically the child's response but not the examiner's question was included in the body of the story. To illustrate, if the child said 'he was running', and was asked 'Who was running?' to which the child responded 'the horse' the edited story would read: 'He was running.' 'The horse.' These clarifications (minus the examiner prompt) were written as separate utterances to help distinguish them as prompted, ancillary pieces to the original, spontaneous utterance. Other adjustments were made so that exact self-repetitions were eliminated thus retaining only the original content and not the repetitions. For example, if the child said 'The birdies are in the nest, the birdies are in the nest, the birdies are in the nest' the story was edited so that only the first statement was included. These edited stories (two per child; one for the Horse story and one for the Cat story) were then analyzed for content structure, informed by Gibney's (1995) and Trabasso et al's (1992) goal plan analysis of Mayer's (1969 ) Frog Where are You. The goal plan analysis used in this study will be discussed in the next section.

Analysis of Story Content

As reviewed in Chapter One, goal plans are the mental schemata that serve to causally link events in a goal-oriented sequence. In a narrative context, they are the conceptualizations of how events are causally linked in an overarching, goal-driven way between episodes as well as within episodes (Trabasso et al., 1992). According to Trabasso et al., goal plans provide the framework to ensure coherence of narrative content. Goal plans, as specified by Trabasso

and colleagues provided the basis for the scoring scheme used to look for the presence or absence of particular content in the Study One and Two stories. Trabasso and colleagues' model of a goal plan hierarchy was chosen as the basis for Study One and Two narrative content analysis because it has, at its foundation, narrative content and specifies the framework from which narrative content events are motivated and hierarchically organized.

Before describing the scoring scheme, this next section will briefly review elements of Trabasso et al.'s (1992) goal plan analysis and how they are instantiated in these stories. The following section will then touch on Trabasso et al.'s findings on narrative goal plan development to illustrate how the scoring stages for this study were derived.

Trabasso et al. (1992) specify the following elements as necessary evidence of a narrative goal plan hierarchy. There must be a *protagonist,* (determined by the character's connection to an activity, state, or object), involved in an *initiating event* (an undesired event related to the activity, state or object of interest to the protagonist) that leads to a *goal* (finding a desired solution to the initiating event), followed by an *attempt* to achieve the goal, concluding in an *outcome* (which Trabasso et al. state is the successful attainment of the goal). These are the elements that a person can produce when looking at pictures and formulating a story. Trabasso et al.'s goal plan constituents listed above formed the basis of the goal plan analysis for Study One and Two.

Trabasso & Nickels (1992) classify purposeful attempts as part of the goal plan hierarchy. In particular, they argue purposeful attempts instantiate local goal plans, which comprise a goal and an attempt to achieve the goal. Based on Trabasso and Nickels' inclusion of purposeful attempts in their goal plan hierarchy, the present study included *purpose* as a goal plan

constituent, regarding it as a local, within-episode manifestation of a global goal.

When children create a coherent narrative based on pictures, they must infer a causal, goal-oriented connection among event sequences. Likewise, to analyze a story as having instantiated a goal plan, Trabasso and Nickels (1992) suggest it is reasonable for the analyst to infer the instantiation of a goal plan if there is an explicitly stated initiating event, an attempt to achieve the goal or a failed outcome, requiring further efforts. Therefore, the present study included inferred goals into the goal plan analysis of the Horse and the Cat stories.

One final constituent included in the goal plan scheme used to analyze Study One and Two stories is *internal state* or *reaction.* According to Stein (1988) internal states or reactions related to goal achievement (i.e., cognitive or emotion-based evaluations of a character's success or failure in attaining a goal) constitute a more elaborate goal plan-based story. Based on Stein's inclusion of internal state or reactions as part of elaborated narrative goal plans, the present study included *internal state* or *reaction* as a potential constituent of the goal plans for both the Horse and Cat stories.

In addition to Trabasso and his colleagues' goal plan constituents that were used to analyze stories in the present study, additional elements were drawn from Gibney (1995). Gibney introduced another hierarchical layer, grouping content elements into major categories and these higher level categories were likewise adapted and included. These adapted categories are: 1) Goal Plan Opening Constituents which included character introductions, opening events, protagonist/other relationship and initiating events, 2) Goal which entails the global goal, 3) Goal Plan Unfolding Constituents which entail events (i.e., attempt and purpose), and 4) Goal Plan Concluding Constituents which include outcome and reactions.

The goal plan constituents used for analysis of the Horse story and the Cat story are presented below.

Constituents in the goal plan analysis.

HORSE STORY CONSITUTENTS OF ANALYSIS

Horse Episode

Goal Plan Opening Constituents

1) Character Introductions
- Horse
- Cow
- Bird

2) Opening events
- The horse was running in the field.

3) Initiating events (events relevant to the establishment of the global goal)
- The horse comes upon a fence.
*or* - The horse stops, then it jumps over the fence.
*or* - The horse sees the cow.

Goal

- coded for explicit or inferred presence of the main protagonist's goal.

Global Horse goal:
- The horse wants to get to the other pasture.
(Note: goal can be **explicitly stated** or judged to be **inferred**.)
To judge the goal as inferred there must be both:
-antecedent or **initiating event** that would set up this goal such as the fence impeding the horse's activity
*and* - an **attempt** to get to the other side of the fence.

Goal Plan Unfolding Constituents

1) Events
- **Attempt** to achieve goal. e.g.:
-The horse tried to get to the pasture.
-The horse tried to get over fence.
-**Purpose**
- to play with the cow.
-to eat the grass on the other side.

Goal Plan Concluding Constituents

1) Outcomes
-The horse got to the other side of the pasture.
-The horse fell.
-The fence broke.
-The horse was injured.
2) Reactions
- Cognitive or Emotional (e.g. the horse 'wondered' or 'thought' or was 'sad' or 'happy')

Non-Horse Episode

-Is not related to horse's goal and is established by initiating event.

Initiating event - Horse falls which sets up:
Non-horse goal: Cow/bird helps injured horse.
Subordinate goal: to bandage the horse's leg.
Internal reaction: e.g. They feel sorry for the horse.
Attempt: Cow/bird tries to provide medical aid to the horse.
Purpose: The horse was hurt and needed help.
Outcome: Implied or explicit result, positive or negative, of attempt: The horse is standing.
For Subordinate goal: the leg is bandaged.

CAT STORY CONSTITUENTS OF ANALYSIS

Cat Episode

Goal Plan Opening Constituents

1) Character Introductions
- Cat
- Mother bird
- Baby birds

2) Opening events
- The mother bird is with its babies in the nest.

3) Initiating events (events relevant to the establishment of the global goal)
- The cat observes the bird flying away and leaving its babies unattended.

Goals

- coded for explicit or inferred presence of the main protagonist's goal.

1) Global cat goal:
- The cat wants to eat the baby birds or to get the birds.

(Note: goal can be **explicitly stated** or judged to be **inferred**.)
To judge the goal as inferred there must be both:
-antecedent or **initiating event** that would set up this goal: the baby birds are unattended.
*and* -an **attempt** to get to the birds.

2) Subordinate cat goal:
- The cat wants to climb the tree.
- the goal is **explicitly** stated.
- the goal can be inferred from an **attempt** to climb the tree
*and* - if a **consequence** of the attempt is stated.

Goal Plan Unfolding Constituents

1) Events
- **Attempt** to achieve goal.
- The cat tried to get at the birds or the cat climbed the tree.
-**Purpose**
-To get to the nest to eat the birds.
-To reach the birds.

Goal Plan Concluding Constituents

1) Outcomes
-The cat climbs the tree but is stopped by the dog.
-The cat doesn't eat the birds.

2) Reactions
Cognitive or Emotional (e.g. the cat 'wondered' or 'thought' or was 'sad' or 'happy')

Non Cat Episodes

-Are not related to cat's goal and are established by initiating event.

Dog Episode:
Initiating event - The cat climbs the tree.
Non-cat goal: The dog wants to prevent the cat from harming the baby birds.
Internal reaction e.g. The dog is angry at the cat.
Attempt: The dog bites the cat's tail and pulls the cat down from the tree.
Purpose: To stop the cat from getting to the nest or to pull the cat down or to get the cat off the tree.
Outcome: Implied or explicit result, positive or negative, of attempt, e.g. the cat ran away.

Bird Episode:
Initiating event - The baby birds are hungry so the mother bird flies away.
Goal: To bring food for her babies.
Subordinate goal: To get worms.
Attempt: It is inferred that an attempt is made to obtain food because she

returns with a worm.
Purpose: To feed the babies.
Outcome: The mother bird returns with a worm.

Adaptations and special considerations in the goal plan analysis of the Horse and Cat stories.

Note that adaptations of Trabasso and colleagues' goal plan constituents were made in order to develop a goal plan analysis scheme specific to the Horse story and Cat story. Adaptation was necessary especially for the *outcome* criterion. Contrary to the successful final outcome in Frog Where are You?, in both the Horse story and the Cat story, the main episode concludes in an unsuccessful attainment of the goal. Therefore, for purposes of the present study, *outcome* included unsuccessful goal attainment.

Note also that the goal plan analyses were based on an ideal, adult-level interpretation of the picture cards. However, it was possible that children's interpretations and narrative emphases might vary to a certain degree from the adult-level ideal. Therefore, in order to fully credit each child for the presence of goal plan constituents, the following considerations were made. In the Horse story, an adult-generated initiating event required an obstacle. To be credited with an initiating event, the child's Horse story needed at least an implied obstacle prior to the attempt. For example, credit for an initiating event was not given if a child simply provided an opening statement then proceeded to state an action/attempt, as in "The horse was running. The horse jumped over the fence." In this illustration, no credit was given for an initiating event because the two stated events appear to be no more than temporally-sequenced occurrences. In other words, no obstacle compels the horse to stop its present course of action and proceed in a different fashion. However, if the child stated "The horse stopped. Then the horse jumped over the fence." these actions, taken together, would be credited as an initiating event. Because the horse stopped, one can infer the

presence of an obstacle, verified by mention of the fence in the following statement. That the horse recognized the presence of an obstacle before reacting to it, would constitute an initiating event. Furthermore, allowance was made particularly for the participants with language impairment. Word finding problems within this group may have precluded explicit mention of an obstacle. In absence of an obstacle label, credit was given if the clause supported the presence of an obstacle. For example, when narrating the Horse story, if the child stated "The horse has jumped over" but no label was given to the object the horse jumped over, the child was credited for the implied presence of an obstacle, i.e., a horse must jump over *something*.

Finally, Trabasso and Nickels' (1992) criteria for inferring the presence of a goal required the specification of an antecedent (e.g. initiating event) and a consequent (e.g., an attempt) in a causal relation. This criterion was incorporated into the present study. For example, in the Cat story, the bird episode involves the bird flying away and returning with worms. The child need not have stated that 'the bird is getting some worms' in order to be credited with an attempt. As long as the child expressed in some manner that 'the babies needed food' then later stated the bird 'got a worm' the child was credited with an attempt because a causal connection was implied.

Once the narrative was analysed according to the goal plan scheme, it was coded using a developmental stages scheme based on findings by Trabasso, et al. (1992).

Developmental Narrative Stages Scoring Scheme

This section begins with a brief description of developmental narrative goal plan trends Trabasso et al. (1992) noted in their study. These developmental trends were used as a basis

for formulating the developmental stages scoring scheme used in scoring Study One and Study Two stories. Next, the scoring scheme will be outlined.

Trabasso et al. (1992) investigated children's ability to include goals and plans in their on-line narration of event sequences. Participants in their first study ranged from age 3 to adult. To summarise their Study 1 findings, the 3 year olds produced narratives that had little evidence of goal plans. Their narratives tended to be descriptions of events or action sequences. The 4 year olds tended to include goal plan constituents in their narratives but attempts lacked explicitly stated purpose. In contrast, 5 year olds produced narratives that had goal plan features including attempts motivated by purposes. Finally, older children and adults included more complete initiating events and offered internal states in their narratives. Based on their findings, Trabasso et al. argued that children follow a developmental progression that evolves from description of events in isolation and moves toward an explanatory description in which events are causally connected. In particular, children progress from narratives that are script-like temporal descriptions of events then develop toward narratives in which events lead to goals and subsequent actions are purposeful.

Trabasso et al.'s Study 1 findings (1992) were used as the basis for formulating a developmental stage scheme of narrative production for the present study. However, it is clear that any attempt to present a developmental progression in a stage-wise format creates artificial boundaries. Narrative development occurs on a continuum - clear boundaries don't exist. In contrast, stage allocation is by necessity discontinuous and marks boundaries. Hence, it is artificial. Nevertheless, utilizing a staged developmental narrative scheme allows one to capture and measure the qualitative differences in narrative content between groups of children. Therefore, for purposes of the present study, the latter consideration was justification

for the development of the narrative stage scheme presented below.

Developmental narrative stages scheme.

Stage 1a: Descriptive of action sequences but no goals are stated.

- Must have temporally-ordered action sequences.
- May contain actions and end states.
- No causal or conditional connections.
- No goals.
- No internal states depicted.
- No initiating event.

Stage 1b: Causally or conditionally related action sequences that lack stated goals.

- Shares the features of Stage 1a except:
- Must have explicitly stated causal or conditional connections between events.

Stage 2: Goal plans with unstated purpose; actions are not explicitly motivated.

- Maintains Stage 1 features except:
- Must have a specified initiating event.
- Must have specified attempt and outcome.
- Must have an inferrable goal.
- No purpose given for actions.

Stage 3: Purposeful goals and plans; attempts are explicitly purposeful.

- Maintains Stage 2 features. In addition:
- Must have explicitly stated goals or purposeful attempt.

Definition of terms (Based on Trabasso et al., 1992):

Initiating event: an event that results in the establishment of a goal. For example, it may be the presence of an obstacle or the removal of an obstacle that establishes a goal.

Goal: A desired achievement. It bridges the initiating event (IE), the attempt and outcome. A goal can be judged to be inferred if certain conditions are met.

Attempt: A purposeful action, usually resulting from an IE.

Purpose: Is an expressly stated objective that is linked to an attempt.

Outcome: The consequence of an attempt.

Causally connected events: The presence of one event is necessary for the occurrence of another event. Event B cannot happen without event A.

Conditionally connected events: The presence of one event allows another event to occur but the second event does not necessarily follow from the first event.

Note that stage allocation was based primarily on the main narrative episode. Goal plan characteristics of secondary episodes were given lesser weight. In addition, responses to examiner questions, beyond responses to permissible prompts, were not considered when narrative stage judgements were made. In other words, only the child's story, free from the influence of the examiner's probing questions, was used to determine stage allocation.

Criteria for each stage represents an ideal. In a few instances a child's narrative did not meet all criteria for Stage 3. In order for such narratives to be rated Stage 3, they had to meet the most crucial criterion of an explicit goal/purpose. If that criterion was met, despite the absence of other goal plan constituents, it was credited as a Stage 3 narrative. Moreover, if a child produced a goal which was contrary to the adult-based narrative goal, it was accepted and the child credited with a Stage 3 narrative, provided the goal was part of a thematic, coherent narrative in which the goal was consistent with other goal plan constituents.

Criteria for Ascertaining the Presence of Causal or Conditional Relations

The main distinguishing characteristic between Stage 1a and 1b is the explicit inclusion of causal or conditional relations. Unlike other stage allocation criteria which have been specified in the section on 'Constituents in the goal plan analysis', causal and conditional relations have not been specified, beyond a cursory definition, presented in the 'Developmental narrative stages scheme' section. Because of its importance in demarcating another developmental narrative tier in the scoring scheme, it is of interest to review the basis for judging the presence of causal or conditional relations. Therefore, this section will briefly review representative research on causal and conditional relations which informed the establishment of criteria for determining causal or conditional relations in this study.

In order for a child to acquire a goal plan framework for narration he or she must progress from a temporal narrative in which action sequences occur in isolation from one another (Stein & Policastro, 1984) to stories which include causal or conditional connections (Trabasso, et al., 1992). Trabasso, Van Den Broek, and Suh (1989) argue that the counterfactual test, i.e. 'If X did not occur than Y would not have occurred', is vital to determining the presence of causal or conditional relations in narratives. According to Cheng and Holyoak (1985) certain conditional scenarios are evidenced by the presence of particular modals i.e., 'can', 'must', and 'may'. Conditional relations may also depict cause and effect (Cheng & Holyoak, 1985). Thus, lexical markers which depict causal connections may be considered reasonable indicators of causal or conditional relations. Moreover, lexical and/or syntactic devices which instantiate goal-directed action or rationale (e.g., in order to achieve Y, X must be done) can, likewise, convey conditional relations.

The above guidelines were used to delineate the richness of possible causal and conditional relations in the Horse and Cat stories and to establish criteria for judging the presence of causal and conditional relations. These criteria are listed below.

- In accordance with Trabasso et al. (1989), the application of the counterfactual test i.e., Given the statement: If X then Y, the counterfactual must be true i.e., If not X, then not Y
- If a goal was stated, it was assumed to automatically entail a causal or conditional relationship
- Language-based indices of causal or conditional relations:
    - Modals: can, should, have to (had to), may, must
    - Conjunctions denoting causal relationships: e.g., so, because, for
    - lexical devices in a primitive story that denote achievement or purpose in the

absence of a global goal plan: e.g., chase away, catch, give, get (as in 'catch') come for X, go for X, do X for someone or something, try to ...

- Temporal lexicon denoting contingent relationships: 'when' X (then) Y, First X then Y

Note that the above linguistic indices are construed as conveying a conditional relationship only when the general logical criteria of conditionality have been met (i.e., the presence of one event allows another event to occur but the second event does not necessarily follow from the first).

- 'Real world' Cause and effect relationships with or without conjunction: Jump - hurt, jump - fall, fall - hurt, injury – bandage

Finally, note that if any of the above criteria was overused in an indiscriminate manner then it was not considered evidence of conditional relations but was assumed, rather, to serve simply as a discourse device. For example, if a child indiscriminately prefaced each statement of action with 'can' (e.g., The horse can run. The horse can jump. The cow can look...) then this was not considered a lexical device to denote a conditional relationship but rather it was considered a simple discourse device to propel the story forward.

Inter-rater Reliability

To evaluate consistency in rating, one rater designated a stage for all the stories. Inter-rater reliability was then established in the following manner. A brief training period was given to a second rater, a graduate student in Speech-Language Pathology with general knowledge of child language. During this training period, criteria for goal plan constituents and stage designation were discussed, followed by independent rating of several sample stories. After

comparison of judgements and discussion about discrepancies, a second series of sample stories were independently rated. After this training, 16 stories from 16 participants in the study were randomly chosen, eight of which were from the NL group while the remaining eight were from the SLI group. Half the stories were the Horse story and the other half were the Cat story. Stories from this group were independently rated. There was agreement on 12 of the 16 narratives achieving an initial inter-rater reliability of 75%. Of the narrative judgements that were discrepant, 4 out of the 5 differed by only one stage. The other differed by two stages. After further coder training and specification of criteria, a second set of 6 randomly-chosen stories from 6 different participants in the study were then independently rated. Again, half were from the NL group and half were from the SLI group. Three of the stories were the Horse story and three were the Cat story. There was agreement on 5 of the 6 stories achieving 83% inter-rater reliability. Further specification and clarification of criteria, including a brief review of stage criteria as well as causal and conditional relations criteria was then undertaken. Both raters then independently reviewed each of the original randomly-chosen 22 narratives from the study and rated them. Results indicated 100% agreement.

The next chapter will describe the results of Study One and Study Two.

# Chapter 3

# RESULTS

## Overview

The intent of this study was to investigate narrative content of stories told by children with Specific Language Impairment (SLI) as compared to children with normally developing language (NL). Narrative content is a product of event representations, which are derived from world knowledge and instantiated through cognitive processes. As reviewed in Chapter One, children with SLI have some cognitive deficits. Since language and cognition are interdependent, it is not unreasonable to expect a child with language disorder to have at least some cognitive abilities that are less efficient (Johnston, 1997); indeed this is the profile of children with SLI. Nevertheless, evidence suggests these children also have some cognitive strengths (e.g., Donlan et al., 1993). particular, children with SLI's performance on some cognitive tasks is in advance of their linguistic abilities (e.g., Kamhi, 1981). When children with SLI are language-matched with NL children, they are chronologically older. With each passing year, children acquire greater world experience, and they become cognitively more advanced. Hence, their event representations, necessary for narrative content, should become more developed. However, given their linguistic deficits and their consequent cognitive makeup, will children with SLI be able to produce narrative content in advance of their language-matched NL peers? It was hypothesized that younger children with SLI would indeed produce narrative content in advance of the language-matched NL counterparts. This hypothesis was addressed in Study One. Study Two examined the narrative content abilities of children with SLI who were mental age-matched with NL peers. Because matching by mental age, using a non-verbal, linguistically mediated task should hold verbally mediated cognitive abilities constant, it was hypothesized that on a task utilizing such cognitive abilities, i.e., producing narrative content, performance would be

equivalent between the two groups. The formalized research hypotheses, which motivated Study One and Study Two, are presented below.

1) It is hypothesized that the narrative content structure of younger children with SLI will be in advance of MLU-matched children with NL.
2) It is hypothesized that the narrative content structure of younger children with SLI will be equivalent to mental age-matched NL children.

In order to answer these research hypotheses, let's first examine statistical data from Study One and Study Two, comparing stage scores between MLU-matched and MA-matched SLI and NL pairs. In order to investigate potential qualitative differences between narrative form and content, we shall then explore representative stage-scored samples of Horse and Cat stories which SLI and NL participants have narrated. Finally, the discussion concludes with trends in narrative content among SLI and NL participants.

Study One

In order to test the first research hypothesis, 10 children with SLI were MLU–matched with 10 NL children. Each child told two stories: the Horse story, and the Cat story. Both stories were analyzed using the Analysis of Story Content measure outlined in Chapter Two and were scored according to the Developmental Narrative Stages Scheme presented in Chapter Two. Stages included: Stages 1a, 1b, 2, and 3. Stage 1a instantiated the fewest goal plan constituents while Stage Three instantiated the most. Thus, Stage Three was considered the most advanced. Once narratives were scored according to the Stages Scheme, stage scores within each MLU-matched pair were then compared. The MLU-matched comparisons of both the Horse and Cat Stories are presented below in Table Three.

Table Three

Developmental Narrative Stage Score Comparisons of MLU-Matched Pairs

| Horse Story | | | | Cat Story | | |
|---|---|---|---|---|---|---|
| Pair | NL stage | SLI stage | Comparison | NL stage | SLI stage | Comparison |
| 1 | 1b | 2 | + | 3 | 3 | 0 |
| 2 | 1a | 1b | + | 1a | 3 | + |
| 3 | 1a | 2 | + | 1b | 3 | + |
| 4 | 2 | 2 | 0 | 1b | 3 | + |
| 5 | 1a | 2 | + | 3 | 1a | - |
| 6 | 1b | 1b | 0 | 1a | 3 | + |
| 7 | 2 | 1a | - | 1a | 3 | + |
| 8 | 1b | 1b | 0 | 3 | 1a | - |
| 9 | 2 | 2 | 0 | 3 | 3 | 0 |
| 10 | 2 | 1a | - | 3 | 3 | 0 |

Note. MLU-matched pairs are presented in ascending order from low to high MLU. For descriptive purposes, pairs one through five have been designated lower-MLU (with MLU-W values ranging from 2.27-3.35), pairs 5 through 10 have been designated higher-MLU (with MLU-W values ranging from 3.72-5.09: see Table One, Chapter Two for complete MLU values); '+' = higher stage score for SLI pair member; '–' = lower stage score for SLI pair member; '0' = equivalent stage scores for both pair members.

Four out of 10 children with SLI told Horse stories with higher developmental narrative stage scores than their NL counterparts and 5 out of 10 children with SLI told Cat stories with

developmental stage scores in advance of their NL counterparts. These results may not support the first research hypothesis. In order to test the hypothesis, the data were considered in terms of a binomial problem. Data were therefore reduced to two outcomes i.e., 1) supports the research hypothesis or 2) does not support the hypothesis. With this analysis, the results for neither story supported the hypothesis i.e., Horse story (binomial distribution, $p > .05$); Cat story (binomial distribution, $p > .05$). It is interesting to note that the highest stage level achieved for the Horse story in both the SLI and the NL groups was Stage Two, whereas a number of children from both the SLI and NL groups told Stage-Three Cat stories. Indeed, 5 out of 10 NL children and 8 out of 10 children with SLI told Stage-Three Cat stories. This ceiling effect for the Cat story made it impossible to determine if there were any real differences between the two groups.

Initial inspection of the data suggested that children at different developmental language levels were performing differently. In order to bring further clarity to the analysis, the groups were split into lower and higher MLU groups. The results were therefore collapsed across story-type and analyzed according to lower and higher MLU groups. Again, data were analyzed using the logic of the simple binary test. The analyzed data revealed seven out of 10 stories from children with SLI in the lower MLU group (i.e., pairs one through five) were in advance of their NL counterparts (binomial distribution, $p < .02$). These findings supported the first research hypothesis, i.e., that younger children with SLI produce narrative content in advance of MLU-matched children with NL. Of the three remaining children with SLI in the lower MLU group, two had equivalent scores and one had a lower stage score than his/her NL counterpart. A definitive pattern of results was not as apparent for the higher MLU group (i.e., pairs 6-10). In particular, 2 out of 10 stories from children with SLI had higher stage scores than their NL counterparts (binomial distribution, $p > .05$). Of the remaining pairs in the higher MLU group, five pairs had equivalent stage scores, and three had SLI members

who scored lower than their NL counterparts. Note that two of the pair-wise scores in the higher MLU group were at ceiling level. When these pairs were removed from the analysis, results were as follows: three pairs were equivalent, three pairs had SLI members who scored lower than their NL match, and two pairs had SLI members who scored higher. Thus, no definitive trend was apparent for the higher MLU group.

In sum, in Study One, the Cat story resulted in many ceiling-level narratives that rendered detection of directional trends difficult for that story. However, when stage-wise comparisons were collapsed across story-type and analyzed according to lower and higher MLU groups, evidence from the lower-MLU group provided support for the first research hypothesis, i.e., that younger children with SLI produce narratives with content structure in advance of their MLU-matched NL counterparts. For the higher-MLU group, no clear group differences in any direction were apparent.

Study Two

In order to test the second research hypothesis, the five and six year old children with SLI were chosen from Study One (eight in all) and were mental age (MA) -matched with eight NL children. The gap in ages between the SLI group and the NL group in Study One required the recruitment of new NL participants for Study Two. All children in the second study ranged in age from five to six years with a mental age-range from 62 to 91 months (see Table Two, Chapter Two). The procedure for testing and analyzing the data was the same as in Study One with the exception that data were analyzed according to the mental age-matched pairs. Table Four, presented below, depicts the results of the developmental narrative stage pair-wise comparisons between the two groups.

Table Four

Developmental Narrative Stage Score Comparisons of MA-Matched Pairs

| Horse Story | | | | Cat Story | | |
|---|---|---|---|---|---|---|
| Pair | NL | SLI | Comparison | NL | SLI | Comparison |
| 1 | 1a | 1a | 0 | 3 | 3 | 0 |
| 2 | 2 | 2 | 0 | 1b | 3 | + |
| 3 | 2 | 2 | 0 | 3 | 3 | 0 |
| 4 | 1a | 1b | + | 2 | 3 | + |
| 5 | 2 | 1b | - | 1b | 3 | + |
| 6 | 3 | 2 | - | 3 | 3 | 0 |
| 7 | 2 | 1a | - | 2 | 3 | + |
| 8 | 2 | 2 | 0 | 3 | 1a | - |

Note. Numbering of pairs between Table Three and Four do not correspond because of differing participants. Pairs are arranged in ascending order of MA, from pair one, the lowest MA pair, to pair eight, the highest MA pair (see Table Two, Chapter Two for full description); '+' = higher stage score for SLI pair member; '–' = lower stage score for SLI pair member; '0' = equivalent stage scores for both pair members.

As in Study One, data were analyzed using the logic of the simple binary test in which two outcomes were possible i.e., 1) supports the hypothesis 2) does not support the hypothesis. The analyzed data revealed four out of eight pairs had equivalent stage scores for the Horse story (binomial distribution, $p > .05$). Of the four remaining pairs, the SLI member in three of the pairs had a lower score than the NL member, and in one pair, the SLI member had a higher score than the NL member. These findings do not support the second research hypothesis. Analysis of the Cat story revealed that three out of eight pairs had equivalent

stage scores for the Cat story (binomial distribution, $p > .05$). However, scores for each of these pairs were at ceiling, rendering it impossible to determine 'true' equivalency. Of the five remaining pairs, four SLI members had stage scores higher than their NL counterparts and one SLI member had a stage score lower than the NL member. Once again, these findings do not support the second hypothesis, i.e., that children with SLI will produce narrative content structure equivalent to their NL counterparts.

However, if the three ceiling-level, pair-wise scores (i.e., Cat Story NL-SLI pairs 1, 3, and 6) are removed from the data, and pair-wise comparisons are collapsed across story-type, a more interesting story emerges. In particular, of the remaining 13 pairs, four had equivalent scores, four had SLI scores which were less advanced than the NL scores, and five had SLI scores in advance of the NL scores. Taken as a whole, these scores (i.e., 4 = '0'; 4 = '-'; 5 = '+') suggest group equivalency. In other words, from a sampling perspective, because the scores are so closely matched in all directions, one can argue the true state of affairs is equivalency. This finding supports the second hypothesis, i.e., that the narrative content structure of younger children with SLI is equivalent to mental age-matched NL children.

Similar to Study One, preliminary inspection of the data revealed performance differences in accordance with different levels of mental age. Therefore, data were analyzed according to lower and higher MA groupings. Pairs one to four were designated lower-MA simply because the MA range (62-70) was lower than pairs five to eight (MA range 72-91). Pairs five to eight were therefore designated the higher MA group. Within the context of lower and higher MA groups, pair-wise performance, collapsed across each story type (minus the ceiling pairs), revealed the lower MA group had three pairs that were equivalent and three pairs in which the SLI children told stories in advance of the NL children. The small sample size makes it more difficult to detect significant effects. Nevertheless, results from the lower

MA group did not support the second research hypothesis (binomial distribution, $p > .20$). In contrast, within the higher-MA group, only one of seven pairs had equivalent scores. Moreover, only two of the seven pairs had an SLI member whose score was in advance of the NL member. Indeed, of the seven pairs, four had SLI members whose narrative stage scores were lower than their NL counterparts. If we conduct a post hoc test to determine the possibility that this many SLI members produced a less advanced story than the NL member, given true equivalence, the binomial probability is $p = .13$. Recall that with this small sample size, it is difficult to derive statistically significant results. However, while the present analysis is not statistically significant, it suggests a trend. In particular, it indicates that children with SLI in this study who have a more advanced mental age, tend to tell less advanced stories than their NL counterparts.

In sum, separate analyses of the Horse and Cat stories rendered results that did not support the second research hypothesis, i.e., that narrative content structure of younger children with SLI is equivalent to mental-age matched NL children. However, when narrative pair-wise comparisons were analyzed across stories, results were in accordance with true equivalence, thus supporting the second hypothesis. Pairs were then divided according to low and high MA and pair-wise comparisons across stories were analyzed to determine if equivalency would hold for lower and higher MA groups. While strong equivalency trends were not apparent for either group, the trend for children with SLI in the higher MA group was to produce less advanced narratives than their NL counterparts.

Narrative-Sample Scores Based on the Developmental Narrative Scheme

It is informative to examine representative SLI and NL stories from each stage level. In particular, it affords an opportunity to compare narrative form and content between the two groups. It also invites an examination of the features specific to each developmental

narrative stage level, (the scheme of which this study argues is illustrative of the process a child undergoes in the acquisition of narrative competence).

In order to achieve the above-stated goals, this next section will begin by presenting sample NL and SLI stories from each of the developmental narrative stage levels. A brief discussion follows comparing narrative form and content between the NL and SLI groups. In the discussion of content, features pertinent to each stage will be highlighted.

Because the Cat story only rendered either Stage 1a or Stage 3 stories among the SLI group (whereas there were examples of all stages among the NL group), the Cat story will just be presented at Stage 1a and Stage 3 so as to preserve the NL-SLI comparisons. Likewise, only one child (a child with NL) told a Stage 3 level Horse story, precluding the possibility of comparing NL and SLI Horse stories at this level. Because no comparisons are possible at this level, no Horse story will be presented at the Stage 3 level.

Stage 1a: Horse Story NL Sample

JH Age 2

One day there's a horse.
And there's another horse.
And another horse.
Then that one jump.
And this one cuts his hair.

Stage 1a: Horse Story SLI Sample

JB Age 6

The horse is running.
Then he stop.
Then he broke his leg.
The cow was unwrapping it.

Some features of narrative form that we can note in JH's story include the use of the indefinite article to introduce the horse. As well, JH, the child with NL, uses the connectives 'and' and 'then'. JH also uses deictic pronominal references i.e., 'this one', 'that one'. Other features indicative of grammatical form include possessive pronoun usage (e.g., 'his'), and variable use of the third person singular verb /s/ morpheme (e.g., 'this one cut**s**'; 'that one jump'). Finally, JH uses simple sentence structure. In contrast, JB, the child with SLI,

fails to use the indefinite article to introduce the horse character and instead uses the definite article. JB is able to use the temporal connective 'then' to propel the story action, and uses a pronominal referent (it) in a subsequent reference to the horse's leg. JB also uses the pronoun 'he' to refer to the horse, once it is introduced. In terms of grammatical form, JB also fails to use the third person singular verb morpheme /s/ (e.g., 'he stop'). Like JH, JB's sentence structure is simple.

In terms of narrative content, JH produces a 'story' in which character labeling prevails. In addition, events are temporally ordered (evidenced by the use of 'then'). However, the events are not linked by any causal or conditional means. There is no initiating event, no goal and no internal state. These features are all hallmarks of a Stage 1a story. Similar to JH, JB, the child with SLI, presents a series of temporal events that are unconnected either causally or conditionally. In contrast with JH, the NL child, JB produces a story in which these events, nonetheless, have a greater, logical, contiguous sequence than events in JH's story. Like JH's story, JB's story lacks an initiating event, a goal, or an internal response. Like JH, this story is at a Stage 1a level.

Stage 1a:Cat Story NL Sample

MR Age 2

That's a bird.
He's tooing.
A kitty-cat is there.
The bird flies up.
This bird flies down.
The dog just...
Then he climbs up to the tree.
There was a bird there.

Stage 1a: Cat Story SLI Sample

JC Age 6

A bird and three birds.
And kitty looking at the nest.
Kitty sitting down.
The kitty's is a cat climbing up.
A dog bite the cat's tail.
And the dog chases the cat.

Note the narrative-form features in MR's story are similar to that of JH. In particular, MR, the child with NL, uses the indefinite article to introduce the bird, and cat for the first time. As

well, MR uses pronouns appropriately to make subsequent reference to the bird. There are also some grammatical forms which are similar to JH. In particular, MR has command of the third person singular verb morpheme /s/. MR is able to use a prepositional phrase to explicitly state the goal of movement. However, note that with a movement verb, the prepositional phrase does not increase propositional complexity (e.g. 'Then he climbs up to the tree'). There are some grammatical form differences between MR and JC, the child with SLI. In particular, JC fails to use a prepositional phrase to denote destination (e.g., 'The kitty's is a cat climbing up'). MR also lacks command of the auxiliary verb 'is' in the present progressive form (e.g., 'and kitty looking ...'). In terms of narrative form, JC fails to use any pronominal referents. This contrasts with MR. Similar to MR, however, JC uses the indefinite article to introduce the bird and the dog.

As with the other Stage 1a stories above, both MR and JC's stories contain content that lacks any causal or conditional connections. No initiating events are stated, no goals are present and no internal states are mentioned. Clearly, these are developmentally rudimentary stories.

| Stage 1b: Horse Story NL Sample | Stage 1b: Horse Story SLI Sample |
|---|---|
| CB Age 3 | JD Age 4 |
| The horsie is running on the flowers. | Horse was running. |
| The horsie is not running. | And the horse walked into the cow. |
| The horsie XX (unintelligible) on the grass. | And the horse did runned so funny. |
| The horsie, it fell down. | He fell down. |
| The horsie is hurt. | Put some paper on his leg. |
| | Because it was hurting. |

CB, the child with NL, produces narrative form that relies on repetition of the initial 'horse' noun referent, rather than a subsequent pronominal referent. In contrast, JD, the child with SLI, uses the pronoun 'he' to refer to the horse after using an initial nominal 'horse' referent.

Also in contrast with CB, JD uses temporal connectives such as 'and'. Moreover, JD uses the causal conjunction 'because'. In terms of grammatical form, both children use prepositional phrases. Evidence of JD's language disorder includes JD's failure to use an article preceding the noun 'horse' (e.g., 'Horse was running) and the lack of subject in one of the sentences that cannot, in this story context, be construed as an imperative (e.g., 'Put some paper on his leg'). JD also lacks the irregular past tense form 'ran'.

Both MR and JC's stories resemble the preceding 1a Stage-level stories in that both have content which lacks overall goal motivation, an initiating event, etc. However, both MR and JC's stories differ from the stage 1a stories in that they both contain events that are causally/conditionally connected. In particular, the connection in MR's story is the 'real life' cause and effect sequence 'The horsie, it fell down. The horsie is hurt.' The causal connection in JD's story is the justification for putting paper on the horse's leg (i.e., 'because it was hurting').

Stage 2: Horse Story NL Sample

JW Age 6

Horse is running.
The horse stops at the fence.
Then it jumped over the fence.
Then it falls down and hurts itself.
The cow fixes him up.

Stage 2: Horse Story SLI Sample

BC Age 6

He run and run and run.
And he stop from the cow.
And he jump from the fence.
The cow push him over.
The doctor come to fix him.

Although JW and BC are both the same age, their narrative form differs considerably. In particular, BC, the child with SLI, fails to introduce the horse, and, instead, relies on a pronominal referent (i.e., 'he'). (Interestingly, BC appears to reserve pronoun usage for the horse, distinguishing it from other characters, i.e., the cow and the doctor, whom BC references with a noun). JW, the child with NL, first identifies the horse by using the noun

form, then makes subsequent reference to the horse, using various pronominal forms. In addition, BC makes some grammatical errors. In particular, BC fails to use the third person singular verb morpheme /s/ when appropriate (e.g., 'The dog **push** him over'), whereas JW correctly uses this form ('The horse stop**s**'). BC, likewise, has difficulty choosing the correct preposition (e.g., 'And he jump **from** the fence') in contrast with JW who has no prepositional difficulty (e.g., 'Then it jumped **over** the fence').

Note that although there are differences in form between JW and BC's stories, both have narrative content structure sufficient to place them at the level of Stage 2. In particular, events are causally or conditionally related (e.g., JW: 'real world' cause and effect sequence; 'Then it falls down and hurts itself'; BC: verb + infinitive denoting intent; 'The doctor come to fix him'). Both stories have an initiating event (e.g., a barrier or reason to quit running; JW: 'The horse stops at the fence'; BC: 'And he stop from a cow'), an attempt (e.g., JW: 'Then it jumped over the fence'), and outcome (JW: 'Then it falls down and hurts itself'; BC: 'The cow push him over. The doctor come to fix him'). Finally, although a global goal (to get to the other pasture or to visit the cow) can be inferred from the initiating event and attempt, no explicit goal is mentioned. These content characteristics embody Stage 2.

Stage 3: Cat Story NL Sample

AP Age 4

The mother bird is on the nest gonna fly
away to get some worms
for her three children.
She's flying away.
The cat looks.
The cat wants those baby birds
because cats like little birds to eat.
The cat is sitting down.
He's gonna climb up the tree soon.
He's waiting until the mother is gone.
The mother is gone so climbs up.
The dog pulls the cat's tail.
Then the dog saves the baby birds.

Stage 3: Cat Story SLI Sample

KB Age 5

Bird there.
Bird flying.
And there was cat waiting
for bird fly away.
Cat want babies and the bird.
Dog saving them.
Climb up a tree.
And the mom come that back
saves the babies.
And the dog's got his piece of his
tail.
And that's the end.

AP and KB, both at Stage 3 content with their Cat stories, nonetheless differ in narrative and grammatical form abilities. In terms of grammatical form, AP, the child with NL, uses more complex sentence structure. In contrast, KB, the child with SLI, not only uses simple sentence structure, but, in this narrative, lacks some linguistic forms such as inclusion of the 'be' auxiliary verb in the present progressive 'is + verb + ing' (e.g., 'Bird flying'), whereas this form is clearly mastered by AP. In addition, KB rarely includes articles (e.g., 'Dog saving...') in this narrative sample. Finally, in terms of narrative form, KB fails to include the conjoining 'and' when appropriate (e.g., 'And the mom come that back (_ _ _) saves the babies'), whereas AP uses the causal conjoining word 'because' in the production of the complex sentence 'The cat wants those baby birds because cats like little birds to eat'. (Note that KB also includes an unnecessary word, i.e., 'that' in the above sentence. This is probably a pragmatic, lexical and syntactic problem. The child probably wants to say '...makes that come back.' where 'that' refers to the worm. In contrast, an adult would say 'bring' rather than cause to come back.)

Because both these stories have explicitly stated goals, in addition to the necessary elements included in Stage 2, they are scored as Stage 3 narratives. The stated goals are as follows: AP: 'The cat wants those baby birds ...'; KB: 'Cat wants babies and the bird'. Also note that AP includes an evaluative comment about the general nature of cats, i.e., 'cats like little birds to eat'. In addition, both AP and KB express a goal to account for one of the secondary character's actions (i.e., the dog). In particular, both suggest the dog is saving the birds.

In sum, the above examples provide evidence of a disparity in linguistic abilities between the NL and SLI pairs. Despite this linguistic disparity, both members of the pair share

qualitatively similar content structure. The linguistic disparity, set against a backdrop of content structure which is equivalent to children with NL, indicates a dissociation between form and content within the SLI group.

A Description of Trends in Narrative Content Across the NL and SLI Groups

As discussed in Chapter One, narrative content emerges from event representations, which are, in turn, mediated by cognitive processes. As event representations undergo further conceptualization, via cognitive processing, children are afforded greater flexibility in thought and are better able to solve problems (Nelson, 1986a). Coherent story construction requires organized, flexible thought and the ability to solve a problem or attain a goal in a 'planful' way. In particular, conceptualized event representations, arranged in a goal plan hierarchy, facilitate coherent story telling. Cognitive processes support the goal plan hierarchy. It has been established that children with SLI have cognitive strengths and weaknesses. This study has sought to determine if this population, compared with NL children, has sufficient cognitive abilities to support coherent narrative content.

A review of specific content elements and trends in the narrative content structure of stories narrated in this study will provide insight into the level of conceptualization an event representation has, and will provide insight into the underlying cognitive abilities engaged in mediating these event representations. By comparing content trends for children with SLI and NL, we can gain insight, not only into narrative content abilities for the respective populations but also into their cognitive abilities. The next section will begin with a description of nonstandard event representations that some children appeared to instantiate when producing the Horse and Cat narrative from pictures. For ease of exposition, these secondary data points will be discussed right here rather than later in the Discussion Section in Chapter Four. Chapter Four will return to consider the major hypotheses.

The next section will consider the implications such nonstandard event interpretation has regarding the nature of event representation as well as the underlying processes which mediate these event representations. Next, the descriptive analysis will examine secondary episodes, which are part of the goal plan hierarchy and may, thus, provide further insight into underlying cognitive processes. Finally, the descriptive analysis will consider the inclusion of internal responses, which represent a higher level understanding of event motivation and delineate the impact events have on others.

Non-standard interpretations of pictures.

Event representations are the foundation of narrative content. When a child constructs narrative content, based on pictures, the child must infer a connection between events, and in order to provide a coherent narrative, the child must arrange these events in a goal-oriented hierarchy (Trabasso et al., 1992, Trabasso & Rodkin, 1994). The first step in the process is perception. How the child perceives individual events in the pictures, and whether or not the child interprets the events as connected, will determine the event representations that are instantiated.

In order to comprehend the pictures as representing connected events, the child draws on event knowledge and event representations. If a child has an incomplete representation, perhaps because the child lacks the requisite event knowledge or is less familiar with the events in question (Hudson, 1986), then the child is less well-equipped to make reasoned judgements and accurate inferences about events. Lacking the requisite event representation, perhaps due to lack of previous experience, the child is left to construct one from the ground up, and, if the task at hand is complex, as the case would be when

comprehending a picture sequence in the construction of a narrative, misinterpretation may result (K. Nelson, 1986a).

Likewise, Hudson and K. Nelson, (1986) argue that when younger children are faced with novel or unusual events, they may not have the representational versatility to adjust to and incorporate these atypical events, so they may attend exclusively to familiar events. If a child focuses on familiar aspects of events, and fails to attend to or acknowledge less familiar aspects of events in a pictorial-driven story construction (Seidman, et al., 1986), the child may be led down the 'garden path' and miss crucial events in the pictorial narrative sequence. Let's now examine instances of children in this study misinterpreting pictures. A brief discussion will then follow, incorporating the above-outlined reasons for misinterpretations, in light of the descriptive data.

One type of misinterpretation noted is the failure to interpret a character as being the same from one picture to the next. For example, JH2N (i.e., JH, age 2, NL) told a Stage 1a Horse story in which he talked of a horse, another horse and another horse as if there were three different horses and not the same horse throughout. Another child, RT5I (i.e., RT, age 5, SLI), Stage 3, likewise discussed the cat in the Cat story as being two separate characters. RT narrated "*And then **the cat** was trying to not chase the bird anymore and **then this one** was trying to come up the tree and get to the birds*". Finally, MD5N, Stage 2, stated that the cow was tying the horse all up then the horse's friends (i.e., the cow and the bird) had to rescue him, suggesting one malevolent cow and one caring cow.

Other non-standard interpretations, common to a number of children, were also noted. For example, a number of children saw the cow as the agent of the horse's misfortune in the Horse story, rather than the giver of medical aid, as depicted in the pictures. The following

excerpts from the children's stories illustrate this. Note that bracketed material has been added in order to assist the reader's understanding of the pronominal references. The examples are as follows: AB2N, Stage 1a: "*They're (horse and cow) fighting*"; JM4I, Stage 2: "*He (the cow) tied that on the horse, he pulled it and he (the horse) fell down*"; BC6I, Stage 2: "*The cow pushes him over*"; CP5N, Stage 2: "*The bull crashed it (the horse) down, then it tied some rope around the horse's leg*"; VM2N, Stage 1b: "*The cow kicked. He's (the horse's) getting kicked*"; MD5N, Stage 2: "*The cow tied him all up and his friends had to rescue him*"; AB6I, Stage 1b: "*He's (i.e., the cow's) pulling his (i.e., the horse's) bones out*".

Although fewer in number, non-standard interpretations of the Cat story were likewise noted. For example, CE3N, Stage 1b, stated that the baby birds were dead. RT5I, Stage 3, stated "*the bird was trying to fly away from the birdies because she was scared of them*". Finally, a few children recounted that the dog consumed part of or all of the cat, e.g., AB6I, Stage 3, explained that "*a dog ate the cat*", KB5I, Stage 3, stated that "*he (the dog) got his piece of his (the cat's) tail*", JOH5I, Stage 3, recounted that "*(the dog) got (the) pretend tail off*", BC5N, 1b, narrated "*Now a dog's got her tail*", JW6N, Stage 3, likewise stated "*the dog caught the (cat's) tail*".

It is interesting to note that misinterpretations were present across all ages within both the NL and SLI groups. As well, misinterpretations occurred within all narrative stage levels. That misinterpretation occurred even for children achieving Stage 3 level stories, suggests that many of the errors were at a local level, independent of the global goal plan representation. Results also suggest that misinterpretation cannot be attributed to faulty cognitive processes within the SLI group, because both groups, and all ages in both groups, were subject to making errors.

JH's error is an exception to the local error trend; rather, it captures a global level error. JH misinterpreted the pictures as representing different horses, likely because JH failed to instantiate a goal plan hierarchy which connects events. Instead, JH interpreted the action as a series of isolated, unconnected events. Consequently, JH likely perceived the various pictorial representations of the same character as separate, and unconnected, i.e., different characters.

Local level errors are evident in many other of the children's errors. For example, for some children, perception appeared to play a role in misinterpreting local action. In particular, those who thought the cat was being eaten misinterpreted the picture of the dog with his tongue hanging out. Instead of a tongue, some children perceived it to be the tail or some other part of the cat because in the previous picture, the dog had latched onto the cat's tail in order to pull the cat down from the tree. The misperception led to the instantiation of an erroneous event representation.

For others, especially those who talked about the horse and cow fighting, or the cow pushing the horse down etc., misperception does not appear to be the reason for the misinterpretations. There is nothing in the pictures to suggest the cow is fighting with the horse. It seems more likely that these children drew from a previous knowledge of events in which fighting often results in one of the participants falling or being knocked down. It is possible that these children, noting that the horse was down, inferred that some external malevolent force was responsible, resulting in the instantiation of a 'fight' event representation. Since the cow was close by, the cow was the likely candidate for instigating the fight. For those children who stated the cow was tying the horse up, misperception may be part of it, but misinterpretation may also result from gaps in their world knowledge, and thus, in the instantiation of appropriate event representations. Cows are not typically cast as

giving medical aid in children's literature. Neither would children encounter this scenario from real world experience. Lack of familiarity with such an event might possibly require the children to construct a novel event representation from scratch, resulting in misinterpretation. Another possibility, based on Hudson and K. Nelson's proposal (1986) is that the children instantiated the more familiar representation, based on aspects of events they were able to attend to, when they were confronted with this atypical event. For example, when these children encounter the picture of the cow wrapping a bandage on the horse's leg, they may instantiate a more familiar 'animal roping' event representation. In particular, horses and cows are often roped and tied on farms. A child, familiar with such an event scenario, would likely instantiate the requisite representation and thus, the original event is misinterpreted.

In sum, the misinterpretation results indicate that misinterpretation occurred across groups and ages and narrative content stages. This suggests the SLI group did not have any more difficulty instantiating accurate event representations than the NL group. It also implies that, in terms of cognitively mediated event representation and interpretation, the SLI group was not any more cognitively disadvantaged than their NL counterparts. Results also indicate that a number of factors may account for the variety of misinterpretations. For example, lack of familiarity with the events could have resulted in erroneous inferences, or incomplete representations. Lack of event familiarity may, likewise, have necessitated the construction of a completely novel representation in the moment, which, given the demands of the task, resulted in faulty interpretation. In addition, a more familiar event representation could have been instantiated when the child was confronted with atypical events. Finally, in a few instances, problems may have arisen at the perceptual level, or may have resulted because of lack of a goal plan representation.

Development of secondary episodes.

In the developmental narrative stages scheme outlined in Chapter Two, it was possible for a child to have left the secondary episodes undeveloped and still attain the highest stage level. Indeed, no child was either credited or penalized for quality of secondary episode(s). Also, recall that each child's story was judged according to a prototypic adult model of the Horse and Cat stories, in which episodes were designated primary or secondary. A child's story was scored according to the primary episode, determined by the prototypic model. Based on Trabasso et al.'s (1989) investigation of goal plan hierarchy, we can surmise that instantiation of a goal plan for the primary episode is the foundation from which goals and plans for the secondary episodes are derived. Moreover, the goal plan of the primary episode is the scaffolding from which a coherent narrative emerges; in a global way, it organizes the story as a whole. Therefore, it is reasonable to score the primary episode, rather than the secondary episodes in determining the developmental level of narrative content structure.

Even though secondary episodes do not directly impact stage attainment, it is nonetheless interesting to note secondary episode development because the characters in the secondary episodes of both the Cat and Horse stories are complementary to the goal plan scheme. Moreover, secondary episodes place additional processing demands on narrators. Given that children with SLI tend to experience some cognitive deficits, related to limited processing capacity, inefficient processing, or attentional problems (Johnston, 1997), it is important to examine this group's inclusion of secondary episodes, compared to the NL group. Therefore, this next section will describe the inclusion/exclusion of secondary episodes in relation to group differences.

In the Horse story, the standard version of the secondary episode (according to the pictures) is that the bird brings a medical kit and the cow bandages the horse's injured leg, after which, the horse stands up. Two children included all but the outcome of this episode (i.e., the horse is standing) in their narrative (e.g., KB5I, Stage 2; BB5I, Stage 1b). A few children mentioned the two secondary characters but no action was attributed to them (e.g., LO6N, Stage 1a; LC2N, Stage 1a). A number of children just mentioned the cow as an agent and the bird was either not mentioned at all or was a passive onlooker (e.g., VM2N, Stage 1b; AB2N, Stage 1a; MR2N, Stage 1b; YW4N, Stage 2; NH5N, Stage 2; CP5N, Stage 2; JW6N, Stage 2; DK6N, Stage 3; JD4I, Stage 1b; JM4I, Stage 2; JOH5I, Stage 2; GB6I, Stage 1a). Several children indicated that the horse was bandaged but no agent was credited for the act (e.g., CE3N, Stage 2; BC5N, Stage 2). Still other children mentioned neither the secondary characters nor the bandage (e.g., CB3N, Stage 1b; AP4N, Stage 2; MW4N, Stage 2; RT5I, Stage 1a).

From these findings on the Horse story, we can see that only two children successfully included both the secondary episode characters and their actions, and neither of these children attained the highest stage level for the Horse story. All other children, regardless of age or group, either didn't include the secondary episode or excluded key events from the episode, such as the bird's involvement. This suggests that for most of the participants, the processing demands of the Horse story (in part, due to the atypical nature of some of the events in the story) were too great for them to fully elaborate the secondary episode, regardless of their language or cognitive abilities.

In the Cat story, two secondary episodes occur. In one secondary episode the bird leaves the nest to find food for her babies and subsequently returns with a worm. In the other secondary episode, the dog rescues the baby birds from the culinary designs of the cat by

pulling the cat down from the tree and chasing it away. There are numerous possibilities of episodic combinations that a child may include in the Cat narrative. Indeed, Study One and Two rendered numerous versions of the secondary episodes, including complete representation of both episodes, to the exclusion of the episodes beyond a cursory mention of the secondary characters. The present account of results will, however, be limited to stage 3 stories and whether or not children scoring stage 3 included the two secondary episodes. Because stage 3 assumes the highest level of goal plan development, it is perhaps most interesting to determine if these children fully detailed the secondary episodes.

Of the NL group in Study One, VM2N, focused on the bird as the main character. The cat was mentioned only peripherally and the dog was not included at all. In contrast, JH2N included and fully developed both secondary episodes. CB3N included the dog episode but the bird episode was not developed, i.e., CB3N indicated the bird flew away but no reason for the departure was given and the bird's return was not mentioned. AP4N provided a reason for the bird's departure (to get food for the children) but didn't mention the bird's return. The dog episode was fully developed, however. Finally, MW4N included a fully developed dog episode but did not mention the bird flying away or returning with a worm.

Of the NL group in Study Two, LO6N included the dog episode but did not mention the bird leaving or returning with a worm. DK6N, on the other hand, had a fully developed dog episode as well as a bird episode. MD5N included the dog episode but the bird episode just included the bird's intent to get food, and did not include the bird's return. Finally, JW6N included the dog episode but did not explicitly mention the bird's departure although he mentioned the bird returning with a worm.

Of the SLI group, JM4I included the dog episode. The bird episode was included in terms of the bird's departure and return, but no food element was included. BB5I did not mention the dog episode, and although the bird episode was mentioned in terms of the mother trying to get the worms to her babies, her departure and return were not explicitly stated. BC6I included both episodes. RT5I included the dog episode but included a non-standard bird episode (i.e., the bird departed because it was scared of the other birds). Similarly, KB5I included a fully developed dog episode but gave a non-standard bird episode (i.e., the bird's purpose was to save her babies, not feed them). Finally, AB6I included the dog episode, and a partially developed bird episode (i.e., the bird flies away and returns with a worm but there is no indication the worm is meant as food for the baby birds).

It is interesting that most of the children from the NL and SLI groups, who attained a Stage 3 level Cat story, included the dog episode. The consistency with which these children included the dog episode may be due to the role the dog plays in the goal plan hierarchy. Specifically, the dog is integral to the cat's success or failure in achieving its goal. In other words, the dog determines whether or not the cat is going to achieve its goal of eating the baby birds. Therefore, if a child instantiates the cat-focused goal plan scheme, it is important to include the dog's actions. It is interesting to note that although most children at this narrative stage included the dog episode, only four children from the combined Study One and Study Two (n=18), NL group, and one child from the SLI group (n=10) explicitly stated the dog's goal (e.g., to stop the cat; to get the cat down from the tree; to save the birds).

In contrast to the number of children who included the dog episode in the narration of the Cat story, far fewer children, who attained Stage 3, included the main goal-oriented actions of the bird episode. As stated before, it is likely the children did not identify the bird as playing a crucial role in the goal plan. Therefore, the need to include all the bird's actions

was less important. Note, however, that there were a few exceptions. A few children identified the mother bird as 'saving' her babies. It is clear that the event representation, which these children instantiated, involved the mother bird as protector, saving her young. For these children, the mother bird was included in the goal plan hierarchy. Interestingly, for the remainder of children whose bird episode remained underdeveloped, a few of these children identified a local goal for the mother bird, i.e., to provide food for her babies. Finally, it is important to note there were no trends noted in the investigation of the Cat story secondary episodes which differentiated the NL and SLI groups.

To summarize, few children, regardless of whether they were NL or SLI, were able to construct a fully developed secondary episode for the Horse story. It is likely that atypical behaviour of the secondary episode participants increased the children's processing demands. In particular, because of the atypical nature of the events in the secondary episode, these children could not readily summon a familiar event representation, thus, taxing their processing ability. As a result, these children were unable to fully elaborate the secondary episode. Similar to the Horse story, descriptive analysis of the content of the Cat story secondary episodes rendered no group differences. Full inclusion of secondary episode events appeared to be governed by the overall goal plan. In particular, the dog episode, which is crucial to the cat goal of acquiring the baby birds, tended to be more fully developed, by more children, than the bird episode.

Inclusion of an internal/emotional or cognitive response.

Internal/emotional responses and cognitive responses are complementary to a narrative goal plan scheme in that they suggest motivation for planning a course of action or can explicate a character's reaction to a goal plan attempt or outcome. Moreover, these tend to be later developing content elements in narratives (Kemper, 1984). This suggests that

greater world knowledge and greater elaboration of subsequent event representations, mediated by cognitive processes, are needed in order for a child to have command over this aspect of narrative content. Therefore, it is of interest to note instances of internal responses and if there are any differences in the frequency and quality of internal/emotional/cognitive responses between NL and SLI children. This next section will examine the instances of internal/emotional/cognitive responses in stories across the NL and SLI groups.

Several children in both the NL and SLI groups, across Study One and Two, included internal responses in their stories. Let's examine these instances to determine whether or not they enhance the goal plan scheme. A few children included emotional responses in their narratives, but these responses appeared to be unmotivated, or unconnected to any of the action taking place. For example, when narrating the Horse story, BC5N, Stage 2, stated at the end of the story that the cow was mad. No preceding event that BC5N narrated could justify this statement of the cow's internal state. Likewise, BC5N ended the Cat narrative by stating 'And now the robin is happy', however, the robin's happiness, in connection to preceding BC5N's narrative content, appeared unmotivated. Narrating the Horse story, MR2N, Stage 1b, recounted that 'there's a sad guy here'. However, in MR2N's story, there was no explicit link of events to this statement and, it's difficult to be sure who was being referenced. Nonetheless, given the preceding event, it is easier to imagine a link than in BC5N's story. In particular, MR2N narrates that "*The XX (unintelligible) is coming. And another lamb. The horse is dead. There's a sad guy here.*"

Although JOH5I's reference to the bird's emotional state in the Cat story was motivated by a prior event, it nonetheless did not serve to advance, or comment on the global goal plan. In particular, JOH5I, Stage 3, stated that "*The cat just XX (unintelligible) and was on a branch.*

*And a cat was gonna knock it down (the bird nest). Then a mama bird they got mad because that (the nest) fall down.*" It is clear that the mother's anger was related to the bird nest being knocked down. Thus, there was a causal link between an event and the bird's reaction. However, the mother's anger did not inspire any further, global, goal-oriented action. RT5I, Stage 3, likewise included a statement about the bird's inner state. Although RT5I's instantiation of this event sequence was nonstandard (i.e., it did not follow the prototypic adult story line) the bird's reaction provided a local, causal link to the bird's action. In particular, RT5I narrated that "... *then the bird was trying to fly away from the birdies because she was scared of them.*" Similar to JOH5I, RT5I presented an inner state that is linked to a local, rather than global goal.

In their narration of the Cat story, GB6I, MW4N, and JW6N, (Stage 3) all provided insight into the cognitive state of one of the characters. In each instance, the cognitive state served to motivate a global goal plan. In particular, each child recounted that the cat was "*thinking about it (the nest)*" or "*is thinking a plan to get there*" or "*has a nice idea*". These cognitive statements about the cat, represent the planning the cat undergoes before acting in a goal-directed way. Note that both a child with language impairment and two NL children were able to instantiate an event representation which included a character's thinking processes. In the narrative, this cognitive activity was directed toward the acquisition of a goal. Clearly, these three children had sufficiently abstract, conceptualized, event representations to effectively serve the goal plan scheme.

In sum, both NL children and children with SLI, were able to include internal/emotional/cognitive responses in their narratives. However, regardless of language group, children at earlier developmental narrative stages were unable to connect statements of emotional state with any particular narrative event. Children at the Stage 3 level were

better able to causally link events with emotional state. Finally, a few children, at developmental stage level 3, were able to incorporate a cognitive state for one of the characters. The cognitive state enabled the character to develop, and carry out a goal plan. These three children provide clear evidence of the instantiation of a conceptualized, global goal plan, supported by an internal response.

## Results Summary

When Study One results were collapsed across story type and measured according to lower and higher MLU-matched groups, there was evidence in the data from the lower MLU-matched group to support the hypothesis that younger children with SLI produce narrative content structure in advance of their MLU-matched counterparts. Likewise, when Study Two results were collapsed across story type, the overall data supported the hypothesis that younger children with SLI produce equivalent narrative content structure to their MA-matched counterparts. When data were further analyzed according to lower MA- and higher MA-matched groups, there were two different patterns of dissociation. In particular, children with SLI in the lower MA group either produced equivalent or higher stage level stories than their MA-matched counterparts while children in the higher MA group tended to produce lower stage level stories than their MA-matched counterparts.

After the main results were analyzed, sample stories, representative of each developmental stage level, were descriptively analyzed according to language competency group. From this analysis, it was evident that children with SLI at the higher stage levels produced narrative form that was inferior to their NL counterparts, matched by narrative stage. Likewise, most of the children with SLI had difficulties in producing correct grammatical forms comparable to their NL counterparts. However, the content structure was equivalent

in terms of goal plan constituents. This clearly demonstrated the dissociation children with SLI have between narrative form and content.

Finally, when trends such as event misinterpretation, inclusion of secondary episodes, and inclusion of internal responses were descriptively analyzed, there appeared to be no differences between the SLI and NL groups. In other words, there were instances when members from both groups misinterpreted events, or failed to include all secondary episode events. There were also instances when members of both groups included internal responses in their narratives.

Descriptive analysis of event misinterpretations suggested that children may make these errors because of faulty perceptual processes, or because events are unfamiliar. Unfamiliar events may have led to the instantiation of incomplete representations, and thus, misinterpretation resulted. Likewise, an unfamiliar event may have necessitated the construction of a novel representation from scratch, in which case, problem solving, or inferential abilities were likely less effective and misinterpretations more apt to occur. Finally, these children may have been faced with an atypicial event, which could have caused the children to instantiate a more familiar event representation to help make sense of the event.

Descriptive analysis of secondary episodes revealed that, if the secondary episodes were integral to the overall goal plan, then they were more likely to be included and more fully developed. If the secondary episode contained events performed by characters not typically associated with such an event, then secondary episodes were likely to be less complete, if included at all.

Finally, descriptive analysis of internal responses suggests that children, regardless of language competency, who reached the more advanced, developmental narrative stage level 3, were more likely to include internal responses that help motivate global goal plan scheme. Children at less advanced developmental narrative stage levels were more likely to include internal responses unconnected to events, or were more likely to include events which were causally connected to local rather than global events.

The following chapter will discuss the implications of the findings covered in this chapter.

# Chapter Four

# DISCUSSION

## Overview

Although narratives, in their totality, are language-rich, socially embedded texts, the focus of this study was to investigate narrative content of children with specific language impairment (SLI) as compared to children with normal language (NL). Producing a narrative requires the integration of knowledge from a variety of domains. For example, narrative content emerges from event knowledge that is acquired through world experience. Narrative content must then be presented in a linguistically sound package and organized into a story schema. In other words, narrative content must be given form. (Narrative form emerges from sociocultural, linguistic, and story structure knowledge). Finally, the producer of a narrative must be sensitive to the listener's needs and make adjustments accordingly.

Cognitive processes are fundamental to and support all these knowledge domains. Because children with SLI tend to have scores within normal range on nonverbal tests of intelligence, it suggests normal cognitive functioning (Leonard, 1998). However, given the role that cognitive processes play in linguistic knowledge, and the subsequent reciprocal relationship (i.e., enhanced cognitive development as a result of linguistic knowledge), researchers and academics, such as Johnston (1994), query the logic of such a profile. In other words, when one considers the interdependence of linguistic and cognitive knowledge domains, is it possible to have language impairment without cognitive impairment? Indeed, current research suggests that children with SLI may have deficits in some cognitively-driven domains (Kamhi, 1981; Camarata et al., 1981, 1985; Johnston & Ellis Weismer, 1983; Terrell et al., 1984). Nonetheless, when children with SLI are language-matched with normal language (NL) children, there is evidence to suggest that they perform better on some cognitive tasks than their language -matched NL counterparts (e.g., Kamhi, 1981;

Camarata et al, 1981, 1985). These findings, coupled with normal scores on nonverbal intelligence tests, indicate that children with SLI have cognitive development in advance of their language skills.

Clearly, for children with SLI, at least one knowledge domain, i.e., linguistic knowledge, is consistently impaired. Linguistic knowledge is imperative to narrative form. Therefore, it is reasonable to expect that children with SLI would create stories in which narrative form is compromised. It is not so clear what the effects on narrative content would be. Are the cognitive abilities of children with SLI sufficient to support story content, especially when story content is dependent on cognitively-supported event knowledge? The present study was designed, in part, to measure if there were qualitative differences in narrative content between language-matched SLI children and their NL counterparts. Because of the likely age differences between the two groups, it was surmised that the SLI group would be at a cognitive/experiential advantage. The second part of the study sought to determine if there would be any qualitative differences in story content when the two groups were matched by mental age. It was expected that matching mental age, using a verbally mediated cognitive measure, would hold verbally mediated cognitive abilities, necessary in the production of story content, at a constant between the two groups. Recall that cognitive processes provide the foundation from which event knowledge arises and that causally connected, goal-oriented story content, in turn, emerges from the conceptualization of event knowledge. Given the relationship between cognitive processes and story content, it was anticipated that cognitive equivalency (achieved through mental-age matching) would result in qualitatively similar story content between the two groups. The following research hypotheses were posited to address these issues.

1) It is hypothesized that the narrative content structure of younger children with SLI will be in advance of MLU-matched children with NL.

2) It is hypothesized that the narrative content structure of younger children with SLI will be equivalent to mental age-matched children with NL.

This chapter will begin by addressing whether or not the research hypotheses were supported in Study One and Study Two and will examine other research which may support or refute Study One and Two findings. Next, Study One and Two findings will be used as a means to review the evolutionary process of narrative production and its implications for children with SLI. A discussion of methodological issues and the need for further research will then follow. Finally, this chapter will close with a discussion on the clinical implications of Study One and Two findings.

## Study One

This section will review results of Study One to determine if the findings support the first research hypothesis or not. In addition, other relevant research will be discussed in light of Study One findings.

Study One was designed to answer the first research hypothesis, that is, whether younger children with SLI were able to produce language content structure in advance of their language- matched, NL peers. MLU-W values were used to language-match the SLI and NL children. Results indicated that within the lower-MLU group, children with SLI produced more advanced narratives than their NL counterparts. This finding supported the first research hypothesis. However, results for the higher-MLU group indicated children with SLI had no strong performance trend in any direction. Thus, results for the higher-MLU group could neither support nor refute the research hypothesis.

Findings for the lower-MLU group are consonant with those of Terrell et al. (1984) in their study on symbolic play. Similar to the present study, Terrell et al. found children with SLI performed better than language-matched NL children on measures of symbolic play. Westby (1984) elucidates the connection between symbolic play and narrative. She states both symbolic play and narratives require symbolic representation and the ability to sequence and plan how represented events will unfold. Likewise, narratives and symbolic play both require the ability to assume character roles. Because of the strong connection between symbolic play and narrative, it is particularly noteworthy that studies in each of these areas indicate children with SLI perform better than their language-matched NL peers. Terrell et al. argue that because the language-matched SLI children were older, they had more experience and, thus, had greater flexibility in play activities. Likewise, the language-matched children with SLI in Study One were older than their NL counterparts. Therefore, they likely exceeded their NL counterparts in world experience, in cognitive and event-representation development, and in their ability to create or infer causal links with other event representations in their instantiation of a narrative goal plan.

However, findings for the lower MLU group are contrary to Gillam's findings (1989). Gillam analyzed language-matched SLI and NL children's stories in order to determine if there were any group differences in the number of 'action-resolution' dyads included in the narrative. His results indicated minimal differences between the two groups. However, it is important to remember that Gillam's participants were older, school-age children, while participants in the present study were younger. Therefore, it makes comparison of results more difficult. Nonetheless, it is interesting to note that results from the higher-MLU group in the present study are similar to Gillam's findings. In particular, when results from the higher group are taken as a whole, (and ceiling level pairs are removed) no trends in any direction are noted.

In other words, there aren't any marked differences between the two groups, as is the case in Gillam's study.

What may account for these findings? Let's begin to answer this question by first considering our expectations of a child's narrative content production as the child develops. Our expectations regarding skill level in narrative content production change as a child develops; we expect that as children make developmental advances, their skill level in narrative content production will also increase. In essence, there is an absolute level of narrative content structure we expect children to achieve when they reach a certain developmental level (as evidenced by advances in MLU, for example). For children with SLI, however, they are unable to meet these expectations because their language abilities have not kept pace.

Now, let us further explore the question by considering reasons for the outcome of the higher-MLU data analysis. Because children with NL in the higher-MLU group tend to be older, their cognitive development would likewise be greater. Given that their language competencies would be commensurate with their cognitive abilities, they could likely effectively utilize language to augment their cognitive operations. Because the children with SLI in the higher MLU group would not have the same level of language abilities as their non-linguistic cognitive abilities, they could not as effectively utilize language as a means of augmenting their cognitive operations in the production of story content, in comparison with the NL children. The net result is that the NL and SLI participants in the higher MLU group were more evenly matched in their ability to produce narrative content structure, despite the SLI participants' age/experience/cognitive advantage.

Study Two

This section will review results of Study Two to determine if findings supported the second research hypothesis. As well, related studies will be examined to determine if their results support or refute Study Two's findings.

Study Two was designed to test whether MA-matched SLI children produce narratives with equivalent content structure to their NL counterparts. It was argued that by holding MA constant, (measured by a mediated cognitive task), cognitively-driven narrative content structure would be equivalent between the two groups. The overall pattern of results revealed that the SLI and NL children did produce equivalent narrative content. This finding supports the above-stated research hypothesis. However, when results were measured according to lower and higher MA-matched SLI and NL pairs, no strong pattern of results was apparent for the lower MA-matched group. Within the higher MA-matched group, children with SLI tended to perform less well than their NL counterparts. Clearly, this last pattern of results does not support the research hypothesis.

Once again, we can look to Gillam's study (1989) to determine if his results support those from Study Two. Besides having language-matched NL and SLI participants, Gillam matched his participants on mental age as well. He found that the NL participants had more action-resolution pairs than the MA-matched, SLI participants.

This disparity in results (i.e., the overall finding in Study Two that MA-matched, NL and SLI participants had equivalent performances while NL, MA-matched participants performed better than their SLI counterparts in the Gillam study) is not so surprising, given the age difference between participants in the two studies. In particular, SLI participants in Study Two were 5-6 years old while participants in Gillam's study were 9-12 years old. Recall the

interrelationship between language and cognition, i.e., that nonverbal cognition mediates the development of language, while language development enhances higher-order cognitive functioning (Johnston, 1994). Given this relationship, we might expect that as children with SLI are faced with increased task demands and performance expectations (as in the Gillam study), their ability to cope with language-mediated, complex, cognitive tasks such as constructing causally connected event representations into a coherent narrative would be increasingly hampered, because of their language deficiencies.

Likewise, the role of language in cognitive functioning, especially in tasks requiring conceptualization, may account for Study Two's finding that higher MA-matched SLI children tend to have lower performance in the narrative content structure task, compared to their NL counterparts. Note that these results resemble Gillam's findings for his older, MA-matched SLI participants. This would suggest that, although the higher-MA SLI group was not as old as Gillam's SLI participants, they may have reached a stage at which language deficits were beginning to have a negative impact on flexible, higher order thought processes.

Let's now pause to consider how the SLI children's language deficiencies might impact the cognitively-mediated instantiation of a narrative goal plan structure. In order to mediate the instantiation of a narrative goal plan in the production of a narrative, the child must infer a goal and plan and sustain the inference throughout the narrative production task. Language can effectively serve the process by allowing the child to hold the inferential hypothesis or thought in mind while the mind surveys the pictorial or mental landscape not only to determine if the hypothesis fits the data but also to pull the narrative product together into a coherent whole. Children with SLI would not have the language facility to effectively achieve this task.

At this juncture it is informative to consider the results of Study Two in comparison with research in which cognitive task performance of children with SLI is measured against MA-matched NL children. As stated earlier, cognitive processes mediate both the initial instantiation of an event representation and the subsequent conceptualization of it and other event representations into a narrative goal plan structure. Because cognitive processes are integral to the development and refinement of event representations, used in the construction of narratives, it is reasonable to review results of studies investigating cognitive task performance in children with SLI as compared to NL children.

As reviewed in Chapter One, children with SLI have weaknesses in higher-order, verbally mediated tasks. Higher-order, verbally mediated thought processes are required in the instantiation of and active utilization of a narrative goal plan, especially in a narrative production task based on picture sequences. Therefore, examining research which targets higher-order, verbally mediated tasks may inform results in Study Two. Research involving higher order mental operations varies with regard to the tasks involved and the purported mental operation involved. What follows is a task description of the various studies. The general outcome of these studies will then be reviewed.

Let's begin with an overview of the types of cognitive tasks addressed in this research. L. K. Nelson et al. (1987) studied MA-matched NL and SLI children who were asked to test hypotheses about problem sets around an array of geometric shapes. At times, explicit input was given and at times it was not. In contrast, Condino et al. (1990) invited age-matched NL and SLI children to perform a series of isolated tasks, (such as identification of a fragmented form, categorization hypothesis testing, etc.) which together were taken to represent the problem-solving process. Another study, designed by Skarakis-Doyle and Mullin (1990), tested comprehension-matched, and cognitive level-matched NL and SLI

children on their ability to appropriately ask for clarification when faced with either ambiguous or unambiguous instructions about which geometric shape to choose from an array. Finally, Ellis Weismer (1985) engaged both comprehension-matched, and MA-matched NL and SLI children in an inference-drawing task based on either a short verbal story or a three-picture sequence. Typically, in the above studies, children with SLI performed similarly to language-matched NL controls; however, they performed less well than their NL, age- or cognitively-matched counterparts.

Results from the studies listed above are interesting because they suggest language impairment can strongly impact cognitive functioning. It is reasonable to assume that language processes can enhance the higher order cognitive tasks presented above. However, when language abilities are impaired (as in children with SLI), then their efficacy in mediating higher order cognitive operations will be limited. Children with SLI will, therefore, tend to perform less well than their MA- or age-matched counterparts on these higher order tasks.

However, the research most pertinent to Study Two is Ellis Weismer's study (1985). In particular, of the above group of higher order cognitive tasks, her task context most closely approximates the narrative context. Likewise, the task of drawing inferences based on observed events is one of the key cognitive activities needed in Study One and Two's narrative production task. Trabasso and Rodkin (1994) argue that children, narrating a story based on pictures must draw inferences about pictured events in order for them to casually connect the pictured actions into a schematized goal plan structure. Therefore, Ellis Weismer's study is relevant. Given the relevance of Ellis Weismer's study, her results, in which children with SLI performed less well on the inference task than MA-matched children

with NL, would appear to challenge Study Two's hypothesis that MA-matched SLI and NL children would be equivalent in their narrative task performance.

As with Gillam (1989), Ellis Weismer used older children with SLI for her study (i.e., children with SLI aged 7;7-9;2). To account for Ellis Weismer's findings, it can likewise be argued that *older* children with SLI begin to lose ground with their MA-matched NL counterparts when they are required to perform higher-order, verbally-mediated, cognitive tasks. In particular, their limited linguistic abilities can no longer effectively mediate the development and fine-tuning of abstract, mental processes. Because of their linguistic deficits, these children are less able to keep pace with their MA-matched NL peers when they engage in verbally-mediated, cognitive tasks. Finally, when the higher MA-matched group performance in Study Two is analyzed, the trend appears consonant with Ellis Weismer's findings i.e., that children with SLI perform less well than their MA-matched NL peers.

Although the tasks Kamhi used in his study (1981) investigating SLI and NL children's performance on a series of cognitive tasks are not likely to be overtly verbally mediated, it is important to consider these results at this juncture because, on the surface, they appear to challenge Study Two's findings. Kamhi not only compared performance of younger, language-matched SLI and NL children but he also examined MA-matched NL and SLI performance. The trend in results indicated that children with SLI out-performed their language-matched NL counterparts but performed less well than their MA-matched NL counterparts. While results from Kamhi's language-matched group support Study One's findings, results from the MA-matched group do not support Study Two's findings.

The answer why the findings between Study Two and Kamhi's study were contradictory may partly lie in the method of determining mental age. In particular, Kamhi used the Leiter

International Performance Scale whereas the Columbia Mental Maturity Scale (1972) was used to determine MA in Study Two. According to Johnston's findings (1982b), the Leiter test is essentially a perceptual test for the age range 3-7. This is the age range included in Kamhi's study. Perceptual tests are likely bottom-up, data-driven, and, as such, are likely not verbally mediated. In contrast, the Columbia test is more conceptual, and, as such, is likely verbally mediated. The cognitive task of constructing and instantiating a causally linked, narrative goal plan is also likely verbally mediated. Because Studies One and Two set out to measure cognitively-based narrative content structure (which is likely verbally mediated), mental age-matches based on the nonverbal, *mediated* Columbia are appropriate. In other words, the processes needed to mediate narrative content structure are held constant or rendered equivalent when the Columbia is used to 'mental age match' NL and SLI children. On the other hand, the Leiter test measures nonverbal, nonmediated cognitive processes, not the mediated cognitive processes required for instantiating narrative content structure. Therefore, the processes needed for the narrative task would not held constant or equivalent by Kamhi's MA-matching. Consequently, it is not surprising that Kamhi's results differ from Study Two's results.

Summary.

In sum, Study One findings for the lower MLU group support the research hypothesis that children with SLI will produce narrative content structure in advance of their language-matched, NL counterparts. These findings are consonant with Terrell et al.'s research on symbolic play (1984). Because of the connection between symbolic play and narratives is so strong, corroborating findings from that area of research is important. In both studies, it is likely that the language-matched SLI children, because they were older, had greater experience and greater development of event representations that offered them a task performance advantage over their NL counterparts. There is less support from Gillam's

study (1989) in which his narrative content analysis between language-matched NL and SLI children rendered few differences. However, his use of older, school-aged children with SLI makes comparisons between findings in the two studies more difficult. Nevertheless, results from Study One's higher-MLU group, in which there were no strong trends in any direction between the SLI and NL groups, are more in keeping with Gillam's results. Because of higher performance expectations, and because children with SLI's language abilities have not kept pace with their overall development, the children with SLI no longer have the same advantage in experience. Thus, performance is more equivalent with NL counterparts.

The overall results in Study Two support the research hypothesis that younger children with SLI and NL children who are MA-matched will produce roughly equivalent narrative content structure. However, results for the higher-MA group indicate a trend toward lower narrative content structure ability for the SLI group compared to the NL group. The overall findings in Study Two are not corroborated by Gillam's 1989 study. Gillam found that when he MA-matched older, school-age SLI and NL children, the SLI children performed less well than the NL children on a narrative content task. Again, because his participants were older, it's difficult to make comparisons or draw any conclusions based on the results. Nonetheless, findings for the higher MA-matched group in Study Two more closely match Gillam's findings. It was surmised that as children age, language plays a greater role in the development and conceptualization of abstract mental representations. Based on the above findings, it would appear that as children with SLI age and attempt to refine their mental abilities, their limited linguistic abilities may have greater impact on cognitive tasks involving verbal mediation. In other words, when complex, higher-order cognitive operations are required, verbal mediation can enhance performance by affording more flexible thought. However, if verbal abilities are not strong, as is the case with SLI children, then children with

SLI will be less proficient in carrying out higher level, mental operations than NL children with the same non-verbal, non-mediated cognitive ability as the SLI children.

Similarly, Ellis Weismer's (1985) found that older children with SLI perform less well, compared to MA-matched NL controls, on the verbally-mediated cognitive task of drawing inferences based on pictorial stories. This finding is consonant with the SLI children's performance in the higher MA-matched group in Study Two. Again, deficits in linguistic skills, which, in turn, negatively affect cognitive processing, likely account for their poorer performance.

Finally, Kamhi's (1981) results appear to refute Study Two's overall findings. In particular, Kamhi found that MA-matched children with SLI did not perform as well on nonverbal, and arguably mediated cognitive tasks. However, comparison of results between the two studies is not prudent because both studies used different means of measuring mental age. In addition, the dependent measure in each study likely required different cognitive demands. In particular, Kamhi used the non-verbal, non-mediated Leiter test to match his participants by MA and many of the tasks required visual-spatial and perceptual abilities. In Study Two, children were MA-matched using the nonverbal, *mediated* Columbia Mental Maturity Scale, a conceptually based task which was in keeping with the higher order, verbally mediated, cognitive operations required for the narrative task.

## A Review of the Developmental Process in Narrative Production in Light of Study One and Study Two

Study One offers evidence that children with SLI, at least at lower MLU levels, are able to produce narrative content structure in advance of language-matched, NL peers. Study Two offers evidence that children with SLI are able to produce narrative content structure that is

equivalent to mental age-matched NL children. However, at the higher mental age level, the trend is for language-impaired children to produce less developed narrative content structure than normal language children, matched for mental age. This next section will explore these results and discuss what they mean in terms of event representation, goal plan development and the linguistic and cognitive abilities of children with SLI. In order to more fully understand the processes involved, the section will begin with event representations and the emergence of narrative.

Children must have world experience in order to build event representations. What a child has perceived of an external event is then instantiated in a perceptual representation. It is from this perceptual representation that cognitive processes are able to further develop and refine the event representation, in conjunction with the child's repeated exposure to the event. The more familiar a child is with an event, the stronger and more conceptualized or abstract the representation is, due to cognitive mediation (K. Nelson, 1986a).

As evident in this present study, children use event representations in their construction of narrative content. Probably the clearest evidence is found in the participants' misinterpretation of pictorial events from which they were to construct their narratives. Many of the 'errors' children made could be attributed to lack of familiarity with an event. When a child is unfamiliar with an event, the child must construct an event representation 'in the moment' or must instantiate a more familiar event representation, even if it contravenes aspects of the event depicted in the pictures (Hudson & K. Nelson, 1986; Seidman et al., 1986). The end result of both these scenarios is event misinterpretation.

Scripts, which are a subtype of event representation, can be the rudimentary foundation of a narrative (Seidman et al., 1986). However, scripts typically lack the goal-directed

connection between event sequences needed for a coherent narrative. A child must infer that events are connected in a causal way, in order to instantiate a goal plan scheme and build a coherent narrative (Trabasso & Nickels, 1992; Trabasso & Rodkin, 1994). Goal plans are the conceptualization of causally linked event-representation sequences, organized in a goal-oriented plan. Evidence from this study suggests that children construct and include secondary episodes, based on the global goal plan. In other words, episodes, which do not have a strong link with the global goal plan, are less apt to be developed. In contrast, children tend to more fully develop secondary episodes that enhance or are integral to the global goal plan.

The developmental stages of the goal plan scheme were evidenced in the narrative samples presented in Chapter Three. The following is a summary of that developmental progression. Children begin by narrating events in isolation; events are unconnected to other events. With greater world experience and knowledge, children identify causal or conditional links between narrative events. Children may then infer a goal plan as the motivation for narrative events but do not explicitly state the goal. Finally, they explicitly state the goal and/or purpose, the inclusion of which, globally connects the narrative events.

As evidenced in this present research, inclusion of emotional and cognitive responses paralleled the developmental stages of the goal plan scheme. In other words, some children tended to include statements of emotional states that were unconnected to any explicitly stated, preceding event. Still others included emotional response statements in connection with a local event sequence. Finally, others who were more developmentally advanced, included emotional or cognitive responses that directly related to global goal plan achievement. In this context, emotional and cognitive responses can enhance the global goal plan by specifying motivation for narrative events. Again, a child must have a higher

understanding of the emotional and cognitive world in order for her to effectively include these elements in a coherent, goal-directed narrative.

Creating a coherent, goal plan-based story, especially one that is guided by stylized, picture sequences of events, some of which are less familiar (as in the Horse story), is a cognitively complex process. Higher order cognitive processes, enhanced by verbal mediation, are engaged in creating goal-driven, hierarchically organized narrative content.

The literature review in Chapter One presented evidence that children with SLI have cognitive strengths as well as weaknesses. Cognitive strengths are apparent from results which indicate that when faced with nonverbal cognitive tasks, presumed to be verbally mediated at a subvocal level, children with SLI tend to out-perform the language-matched control group (Kamhi, 1981; Camarata et al., 1985). In other words, these children with SLI tend to have cognitive abilities in advance of their linguistic abilities. Other strengths include the ability of children with SLI to utilize a visual code rather than a verbal code to process information when verbal codes are unavailable (Johnston, 1997). Finally, that children with SLI perform within normal limits on nonverbal tests of intelligence is further evidence of their cognitive strengths.

It is these cognitive strengths, enhanced by world experience that enabled the children with SLI in Study One's lower-MLU group, to produce more developed narrative content structure than language-matched controls. In particular, results from Study One suggest that the SLI group, being chronologically older than the NL group, could draw on enhanced event representations developed through world experience and augmented by cognitive growth.

As reviewed in Chapter One, children with SLI likewise have cognitive weaknesses. In addition to the higher order, verbally mediated cognitive deficits discussed earlier in this chapter, there is evidence that children with SLI also suffer cognitive deficits when they perform non-verbal, non-mediated cognitive tasks such as visual imagery tasks (Johnston & Ellis Weismer, 1983) or dual tasks which involve matching visual stimuli while attending to an auditory signal (Riddle, 1992, cited by Johnston, 1997). Researchers (e.g., Johnston & Smith, 1989) have suggested that these cognitive difficulties could arise if children with SLI have a reduced processing capacity. Children with SLI may be able to effectively process information, if the system is not taxed. However, their abilities deteriorate as processing demands increase.

## A Summary of the Nature of Specific Language Impairment, Based on Study One and Two Findings

What insight can this study provide about the nature of specific language impairment? This section will explore the above question. Given their linguistic difficulties and the role that language plays in the enhancement of cognitive processes, it is reasonable to expect that children with SLI would have cognitive difficulties and research bears this out. Nonetheless, as this present study has shown, younger children with SLI who are at a stage when event representations are not highly conceptualized or abstracted, can produce narrative content structure in advance of their linguistic abilities. In other words, despite some cognitive deficits, these children are able, through their experience with the world, to instantiate event representations and then further elaborate them through cognitive mediation. World experience enhances cognitive development, which, in turn, enhances the elaboration of event representations. The current study has provided evidence that younger children with SLI do have sufficient world experience to causally link event representations into a

narrative goal plan scheme. Using the narrative goal plan scheme, they can produce coherent narratives, despite their linguistic difficulties.

However, when pictorial events, from which they are to base their narrative, are unfamiliar, children with SLI may lack the flexibility of thought to build novel representations from previously existing ones. Faced with unfamiliar events, in addition to their linguistic deficits, children with SLI may not have sufficient processing capacity to deal with the new demands and produce coherent narrative. This may account for why no child with SLI could produce stage three narrative content for the less familiar Horse story.

Evidence from Study Two indicates that as children with SLI advance in their cognitive development and reach a higher mental age, their linguistic deficits may begin to negatively impact mental operations requiring verbal mediation. At a comparable mental age, children with NL are able to effectively utilize their linguistic ability in the quest of building more highly conceptualized, abstract event representations in the service of coherent narrative. Such event representations afford greater flexibility of thought. Because of their linguistic deficits, children with SLI are disadvantaged in this process. Thus, they are less able to produce narrative content comparable to their normal language peers who are the same mental age.

Issues in Methodology

While Study One and Two have garnered results that can inform us about the nature of SLI in relation to narrative content, it is important to consider methodology that could impact performance. This section will discuss these issues.

A few issues are of importance. One is that in Study One and for the SLI children in Study Two, a number of different examiners were involved in collecting data from the children

(recall that these data were derived from a larger, cross-linguistic morphology study). Although guidelines for standardization were in place, some examiners had different interaction styles with the children, resulting in some variation in the amount of prompting children received. This could have affected individual results, but the effect would likely be evened out across group measures. Moreover, for children who were reticent, the examiners had to use more prompts in order to encourage the child to complete the narrative task. Although examiners were instructed to keep prompts neutral, greater prompting could have resulted in a more fully realized narrative product. Again, reticent storytellers were evident in both the SLI and NL groups, so the effect would have been evened out across groups. Another issue deals with the procedure before the participants began narrating. In particular, all children were invited to arrange the pictures according to their idea of a good story. If the child's picture arrangement did not comply with the adult standard, then the pictures were rearranged. It is possible that if children instantiated one set of event sequences, based on their personal arrangement, then they would be faced with inhibiting the initial sequence, in favour of the adult-standard event sequences. This may have been especially troublesome to children with SLI whose capacity limitations would be taxed by this new processing demand. Likewise, if they were limited in the flexibility of their event representations, they may not have been able to as readily make the transition to the adult-standard sequences as the NL children could. Again, this situation may have been evened out across the groups, considering the younger NL children also likely lacked the flexibility to inhibit their representations and instantiate a new sequence of event representations.

The picture sets themselves may have, likewise, provided some challenges for the children. The pictures for both stories consisted of stylized line drawings that may have placed further perceptual and interpretation demands on the children. Moreover, the children's familiarity

with the events in the stories may have influenced their ability to instantiate a higher level goal plan structure. For example, the Horse story depicted events that were likely less familiar to the children than the events depicted in the Cat story. Event unfamiliarity would have placed additional demands on the children, requiring them to either construct a new event representation in the moment, or engage a more familiar event representation in an effort to 'make sense' of the pictured events (Nelson, 1986a). The increased demands may have, in turn, resulted in lower performance on the content structure measure. In effect, the children's true competency level may not have been apparent because of the challenges posed by the unfamiliarity of the events. On the other hand, we can be more confident in the robustness of the children's high level performances when narrating the Horse story. Moreover, because the Cat story depicted more familiar events, it afforded an opportunity to compare children's performance levels when faced with both a familiar and unfamiliar narrative events.

Finally, we must consider the issue of small sample size. While a trend was apparent in the higher-MA group, in that children with SLI in the group tended to have lower performance on the narrative task, further study, with larger samples, is now needed in order to test the robustness of this trend.

## Clinical Implications

Results from Study One and Study Two speak to the intervention needs of children with SLI. First, these two studies underscore the importance of narrative as a means of determining strengths and needs in this population, in both narrative content *and* form. Second, results suggest that clinicians can build on children with SLI's relative ability to produce coherent narrative content when given familiar event sequences. In particular, once children with SLI have command of goal plan schemes, the clinician can utilize this familiarity, coupled with

familiar event sequences, to provide the scaffolding from which to introduce new linguistic structures in a narrative context. Moreover, narratives can provide the means of inferring causal connections between events. Instantiating a goal plan scheme can help children with SLI to augment problem-solving and reasoning skills. Finally, results underscore the importance of early intervention. In particular, at an earlier age, children with SLI have sufficient cognitive abilities to develop event representations and to utilize these in making sense of the world. However, as these children with SLI age, cognitive gains begin to diminish due to the linguistic deficits these children have. In other words, these children do not possess the linguistic ability needed to effectively augment and refine mental operations. With early intervention, children with SLI are afforded stronger linguistic skills in the service of enhanced cognition. In turn, enhanced cognitive abilities will benefit linguistic needs.

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