

**THE COMPREHENSION OF THE RELATIONAL TERMS BECAUSE AND SO BY
PRESCHOOL CHILDREN**

by

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ABSTRACT

The comprehension of the relational terms *because* and *so* was investigated in preschoolers aged 3;3 - 5;8. The children were told short stories and then were asked to complete sentences that dealt with story content and contained these words. The experiment was designed to see whether age, familiarity with story content, the use of pictures, or the particular term (*because* vs. *so*) would affect children's answers. The results indicated that increasing age and familiarity of story content significantly improved performance. Three year olds provided correct answers only for the stories with familiar content, while five year olds were beginning to succeed even when the story content was new. There was also evidence that pictorial cues had a different effect for the two different relational terms, and that pictorial cues interacted with content familiarity in a characteristic manner at different ages. Findings from this study provide support for a model of lexical development in which the first uses of relational terms are context dependent. This could indicate that early lexical representations are incomplete or that the processing of complex sentential relationships can exceed children's attentional resources.

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CHAPTER 1

Introduction

The development of children's understanding of word meanings has been under study for many years. One intriguing aspect of the research findings concerns differences in the types of words that children learn at various stages of development. Very young children seem able to connect a word to an object or action, but they do not seem to understand words such as before, after, because, so, if, but, and or. The factors that influence the acquisition of these relational terms are not well understood. Unlike other vocabulary terms these words do not refer to objects or actions but rather to the spatial, temporal or logical relationships among them. The term because for example refers to a causal relationship. In a sentence such as "he fell because the boy tripped him", "the boy tripped him" would express the cause of "he fell". This relationship is indicated by use of the word because. There is no concrete, observable referent for words like because. Children must infer their meaning by interpreting complex and diverse events. When one acquires the understanding of a relational term it is assumed that the cognitive abilities reflected by or associated with that term have also been acquired.

Because of their less concrete nature and their dependence on the cognitive abilities of the individual it would be

assumed that relational terms would be acquired later than more concrete vocabulary terms. In fact, investigators have found this to be generally so. However, similarities among findings tend to stop there. Naturally one would expect differences in findings between the different relational terms depending on the cognitive abilities involved and acquired. However, age of acquisition differences have also been found for the same relational term. The question then arises as to why the differences in results on age occur.

Lucia French and Katherine Nelson have addressed this problem by looking at differences in results as the consequence of differences in methodology, especially differences in the contexts used in stimulus materials. They argue that conflicting results could be due to specific variables which could, if changed, affect the outcome of a study. In particular, French and Nelson discovered that familiarity or prior knowledge had an effect on children's performance. To date this effect has primarily been seen in studies of the words before and after. Researchers have demonstrated that preschool children can comprehend the terms before and after given a supportive context. Supportive context is a fairly broad notion that includes familiar context, i.e. one for which a child has already developed a script or event representation. Children's performance has been improved by presenting before and after in a familiar context.

A few investigators have also studied the terms because and so. We know that these words appear in children's expressive

vocabularies between ages three and five, but many questions about their acquisition remain unanswered. In particular, it is not known whether familiarity of context will affect performance on these terms. The purpose of this study is thus threefold, to observe young children's comprehension of because and so, to see how contextual variables such as event familiarity affect children's causal expressions, and to add to our general understanding of the acquisition of relational terms.

CHAPTER 2

Review of the Literature

Linguistic Expression of Temporal and Causal Relations

Terms such as first, before, after, when, because, so, if, but, and or serve to establish a relationship between propositions. By using relational terms one is able to express a logical, spatial, temporal or causal relationship linguistically. We can assume that if a child understands a term that marks a relationship, he/she has also acquired those cognitive abilities which allow him/her to understand that relational concept.

Two particular sorts of relationships will be discussed here as background for the current study: temporal notions concern the order or 'position' of states or events in time; causal notions concern the relationship whereby one state or event brings about a second state or event.

There are a number of ways to express temporal order relationships between events. One very simple way is that in reporting a series of events, the order of mention follows the natural order of occurrence. This can be done by using the term "and" or by simply reporting the events in a sequence with no connector or marker. However, this particular rule of English discourse can be violated through the use of temporal relational terms. For example, in "Before she went to the store she ate

lunch", the actual order of events is she ate lunch then she went to the store, i.e. the opposite of the order of mention. This order of events is indicated by the relational term "before". If the term "before" was left out, the information about the order of the events would be implicitly changed. Another example is "She cried because he hit her". In this example, the order of event occurrence is he hit her then she cried. The difference between the two examples is that the second one focuses on the causal relationship between the ordered events. Both sentences refer to events that are ordered in time, but the term "because" expresses the idea that Event 1 is the consequence of Event 2. The temporal relationship remains implicit. Like temporality, causality may be marked by relational terms, or it may be implied by discourse structure or content.

Children's Understanding of Temporal and Causal Expressions

There seems to be little dispute that causality is a concept that is acquired early, or at least that preschool children have some knowledge of it. Even Piaget (1928) recognized that preschool children show some sensitivity to causal relationships. Piaget identified three types of causal relations: motivational or affective, concrete physical, and logical deductive. He concluded that very young children master affective causality before physical causality, and physical causality before logical causality. Since he relied primarily on verbal data, his observations show that there are non-linguistic factors, e.g. the nature of the causal

relationship, that can affect expression or understanding of causality in a sentence.

Despite agreement on the early appreciation of causal relationships, there is lingering dispute over the age at which children distinguish causes and consequences in their speech. Piaget found that it was not until age seven or eight that this occurred. Emerson (1979) likewise found that five year olds, when given a sentence with because, could understand the causal relationships between two events but failed to understand the expressed order of events. Her findings suggested that this latter understanding was not acquired until the ages of seven or eight. The data from Emerson's experiments suggest that "cause (x,y) becomes part of because before the child realizes that unidirectional event order is also a component of because" (pg. 300).

Why should children be able to think about causal relations as preschoolers, and still be confused about causal terms at age seven? One possibility is that children lack the temporal concepts they need to distinguish cause from effect. This seems unlikely, however, given French and Nelson's (1985) study of preschool children in which they report that "virtually all children demonstrated a sensitivity to temporal structure in their descriptions" (p.4) and that this occurred as early as three years of age.

One feature of theoretical models that connect cognition with language, e.g. temporal and/or causal concepts with causal

terms, is that there exists a lag between the time that a child acquires a specific cognitive ability and the time that he/she is able to use or understand a word that describes such a cognitive concept. French and Nelson (1985) state that "knowledge or cognitive competence, may exist prior to or apart from the ability to express such knowledge linguistically" (p. 83). Such a time lag suggests that when comprehension occurs one can assume certain cognitive competencies, but that when comprehension has not occurred one cannot automatically assume that the prerequisite cognitive skills are not present. It may be, instead, that a given term is difficult to learn because of its linguistic properties or because it rarely occurs in speech to children. Or, as a third possibility, it may be that the child actually knows the term but that something about the assessment procedures does not allow the child to reveal that knowledge.

Before I attempt to evaluate these possibilities, I will present a brief summary of past studies on children's knowledge of because, so, before, and after. Although the eventual focus of my experiment will be on the causal terms, research on before and after has been extensive and relates to the present project in two ways. First, before and after are linguistically similar to because/so since both sets of terms refer to ordered events and belong to the grammatical class of conjunctions. Secondly, the before/after literature includes much discussion of methodological issues which apply equally to the studies on because/so.

Studies of Before/After

Clark (1971) focused on the acquisition process, and interpreted her findings as indicative of at least three stages in the acquisition of the terms before and after. She argued that children acquire the meanings of these words component by component. In the initial stages, preschool children understand that before and after express [time], then [order], relationships, but don't yet know which term expresses the [+prior] meaning. In effect, young preschool children have some knowledge of the words before and after, but do not yet comprehend their full meanings. The gaps in their knowledge lead to systematic 'errors' in language comprehension, e.g. using order-of-mention as the cue for order of events, or responding to after as if it were before.

Whereas Clark (1971) focused specifically on the acquisition process and took her results as evidence of its nature, other investigators have focused on how different situational variables can affect performance. For example French and Brown (1977) found that preschoolers were able to accurately act out the event sequences in sentences containing before and after, at a younger age than was previously thought. This improved performance was determined by whether or not the nature of the event sequence provided support for understanding the relational term. Supportive, redundant contexts are those in which the inherent nature of the events determines the sequence. An example of such a predictable sequence would be "She fills the bottle before she feeds the baby". Arbitrary sequences, e.g. "He is going to the

store before he takes the dog for a walk", are those which can reasonably occur in any order. French and Brown (1977) hypothesized that children learn the meanings of before and after first in supportive, redundant contexts, and then apply this knowledge to the comprehension of these terms when they describe event order in arbitrary sequences. Further support for this hypothesis was provided by Kavanaugh (1979).

In a similar vein, Carni and French (1984) explored the role of context by studying differences in performance for sentences describing familiar but invariant events, and familiar but arbitrary events. This study differed from the previous ones by controlling the familiarity of the events. Children were asked to answer before, after and when questions referring to pictured event sequences. They found that even with familiar events, three year olds performed well with invariant sequences only, while four year olds performed well with both types of sequences. They therefore concluded that event type influences performance but that its role diminishes with age.

Pamela Coker (1978) demonstrated how syntactic variables, i.e. grammatical function as preposition vs conjunction, and task variables, explicit reminder about two clauses, can interact and affect the child's interpretation of before and after. She had three different tasks reflecting the different syntactic and task variables, one of which was a preposition task and one of which was a subordinate clause task. For both prepositional tasks the child was asked to memorize the temporal order of a set of three pictures

of simple objects. For Task One the child was then asked questions in the form "What did I show you before/after X?". For Task Two the child was asked questions in the form "Did I show you the X before the Y or after the Y?" For Task Three, the subordinate clause task, the child acted out with puppets, four before/after sentences.

Coker found that performance on Task One was superior to that on Task Two which in turn was superior to that on Task Three. She concluded that before and after are first acquired as prepositions (e.g. Jill went to the store before noon) and then as subordinating conjunctions (i.e. Jill ate lunch before she went to the store). She argued that Task Two seemed to involve "greater cognitive operations which overload the child's working memory, producing failure on this task" (p. 274). Coker also noted evidence of two response strategies, i.e. main-clause-first and order-of-mention, that children used on Tasks Two and Three, and commented that these strategies "cannot be used to infer partial knowledge (or lack of knowledge) of before and after" (p.274) because half of the children using these strategies succeeded on Task One. Coker also noted how the task variable could affect the use of a strategy. For example, the order-of-mention strategy occurred more often than the main-clause-first strategy when the child was made aware of both clauses.

Findings from the various studies on before and after differ in part because of the differing focus of the researchers. Researchers have shifted their attention from the acquisition process to the effect of situational variables such as context or

task type. Such variables are seen as contributing to the overall cognitive load of language processing and hence to a child's success or failure with a relational term. Studies of before and after also introduce the notion of systematic response strategies which children may use when they do not fully understand a term or sentence. In the next section, we will see that all of these themes recur in the literature on because and so.

Studies of Because/So

Piaget (1928) found, in doing a sentence completion task with because, that young children completing the sentence " X because ..." would do so with an antecedent as often as with a consequence. That is, a child might complete "the dog bit him because he teased it" (antecedent) as often as "the dog bit him because he cried" (consequence). He also found that full understanding of the term was not accomplished until at least age seven or eight.

Corrigan (1975) studied children ages three to seven years, using nine tasks to test both comprehension and production of because. She looked at three kinds of causality: physical relations in which only physical states are connected (e.g. stones breaking windows), affective-causal relations in which affective states are connected with physical events (e.g. crying because of being punched), and concrete-logical relations which include relationships of implicature between ideas or judgements. She concluded that performance on the tasks was affected by the type of

causality involved. The results indicated that affective items were easier than physical items which in turn were easier than concrete-logical items for several of the tasks. Corrigan also concluded that preoperational children, i.e. those (according to Piaget) under the ages of seven or eight, cannot comprehend the chronological order of items joined by because. Regardless of the syntactic position of the subordinate clause, i.e. regardless of whether cause is mentioned prior to effect or effect prior to cause, younger children will interpret clauses joined by because as meaning "A happens then B". This leads to 'correct' performance on sentences with preposed because, and is the same order-of-mention strategy reported by Clark (1971) for before/after.

Harriet Emerson (1979) took a somewhat different approach to studying the effect of the nature of the linked events. She compared school age children's comprehension of 'reversible' sentences and 'non-reversible' sentences containing the term because, and found that performance on non-reversible sentences was significantly better. For example, performance would be better with the non-reversible sentence "The snowman started to melt because the sun started to shine" than with the reversible sentence "He could hear the loud noises and the laughing because he went outside". In a non-reversible sentence, the inherent nature of the events makes one of them more plausible as an antecedent and the other as a consequence. Emerson argues that these semantic constraints help the child comprehend the order of events despite syntactic variation, whereas in reversible sentences the only cue

available is the word because. Like Carni and French (1984), Emerson also concludes that as children get older they become less dependant on such contextual support. However, she interpreted her data to indicate that full comprehension of because is not seen until ages seven or eight, regardless of the type of event used - a substantially older age than was reported by Carni and French. Although a younger child will demonstrate an understanding of the causal nature of the term, assignment of antecedent and consequence roles will remain affected by order of the clauses. Interestingly, due to differing results for the use of order-of-mention strategies within her two experiments, Emerson suggested that "the order-of-mention strategy is restricted to those tasks which require some sort of event or picture ordering on the part of the child" (p. 297). Thus Emerson argues that task variables, as well as event type and syntax, can affect children's responses.

Bebout, Segalowitz and White (1980) in studying because and so, tested children ages 5;10 to 9;9, using an enactment task (listen to a sentence and do it). They manipulated syntax and removed semantic/contextual cues. Results indicated that the ability to interpret context free sentences with a noncongruent order, i.e. one in which effect precedes cause, was not acquired until about age nine, even later than had been reported by Corrigan (1975) and Emerson (1979). It seemed that when semantic and contextual cues were removed children under nine were not able to pick up the syntactic and lexical cues given by the presence of the word because.

Emerson and Gekoski (1980), studying the comprehension of because and if with children ages two to eleven, likewise argue that the earlier studies had overestimated children's knowledge, and that the true age of comprehension was quite late. Using a variety of tasks, including imitation, comprehension (choosing one of two picture sequences to go with a sentence), recognition (judging sentences with connective or structure differences as heard before or not), synonymy (judging equivalence of meaning in sentences with different connectives or structures), logical ordering, reversibility and classification, Emerson and Gekoski found that consistent comprehension of because and if are not apparent until ages eight or nine. An important note here, however, is that this finding was based on tasks in which contextual cues and semantic constraint cues were eliminated while the studies with earlier ages of success had provided some degree of contextual or semantic cues.

Emerson and Gekoski ultimately conclude that "comprehension of because and if appears to develop gradually and is related to the development of certain operative rules" (p. 202). In line with their Piagetian commitments, Emerson and Gekoski are suggesting that certain levels of reasoning ability may be prerequisite to the complete understanding of the terms because or if. This general line of argument, however, could easily be extended to other aspects of cognitive growth, a point that will be examined further in later sections.

Lucia French (1988), in studying the comprehension of

because and so with children ages five to eight years, used an enactment task with logically unconstrained content, and a sentence completion task with familiar and generally constrained content. Both tasks manipulated clause order. Results from the enactment task confirmed the findings of earlier studies. However, in comparing performance on the two tasks a discrepancy was discovered in children's understanding of the order component of meaning. Performance on the sentence completion task surpassed that on the enactment task. Results from the sentence completion task indicated that children fully comprehend because and so at age six, a considerably earlier age than had been indicated by previous investigators. French argues that children were more successful on this task because the event sequences were familiar (and hence nonarbitrary), but acknowledges that other task variables could have played a role.

The different studies have looked at different variables including task type, position of the relational term in relation to the clauses, reversibility of the sentences (clauses) etc. as well as combinations of these variables. Through manipulation of these variables researchers have come to estimates regarding the age at which understanding of the temporal terms because and/or so occur. In many studies this age appears to be seven to nine, but later studies tend to decrease this age stating that it is dependant on a number of variables and manipulation of these variables, that may not have been considered in earlier studies.

It is obvious that the study of the comprehension of

because and so is not nearly complete because of the complexity of the variables involved and because each of the above studies still leaves many questions unanswered. In the following sections I will turn from description of prior studies to discussion of explanatory models. I begin with a brief overview of two models of lexical acquisition that have been applied to data from because/so experiments, and then proceed to discuss in greater detail the factors that seem most likely to have influenced children's performance.

Models of Development

There are basically two models of the development of the acquisition of relational terms. The first was introduced by Clark (1971). As noted earlier, she discovered that children made systematic errors in comprehension of the terms before and after that indicated at least three stages in the acquisition of these terms. From these stages and the systematic errors observed, Clark proposed her "componential" or "semantic feature" model of the developing understanding of relational terms. This model basically stated that a preschooler (young child) does not at first know the entire meaning of a word. He/she only knows certain features (semantic components) to begin with but adds to these features as he/she learns more about the word. Because of this, certain errors will show up depending upon what stage a child is at or what features he/she knows. Clark proposed three basic components for the meaning of the words before and after, ie. TIME, SIMULTANEOUS

and PRIOR, learned in that order. She further argued that children who have not yet acquired the PRIOR component of these terms are likely to respond as if after meant before. Other investigators extended this approach to the study of the word because, hypothesizing two components, CAUSE and ORDER. Researchers such as Corrigan (1975), Emerson (1979, 1980) and Bebout et al. (1980) felt that children do not acquire the ORDER component (ie. cannot describe the correct order nor comprehend it) until at least age seven or eight. Emerson (1979, 1980) did state, however, that children do understand the causal component by about age five.

Unfortunately for Clark and her followers this model did not hold up too well for other researchers. To begin with, the errors that Clark observed in her elicited production tasks were uncommon in other researchers' studies involving preschoolers' spontaneous productions (French and Nelson, 1985). French and Nelson in analyzing transcripts of interviews with three to five year olds involving familiar events, found that children not only produced the terms before, after, because, so, if, but and or, but in most cases did so accurately. Also, according to French (1986a) the errors that were produced were not ones that would be predicted on the basis of the componential models. These researchers then came up with their own model, the contextual model.

Two of the most influential researchers involved in developing the contextual model were Katherine Nelson and Lucia Ann French. French (1986a), in her argument against previous models and the studies they were based on, states "most studies designed to assess children's comprehension of relational terms have used

sentences reporting arbitrary (and thus unfamiliar) relationships as stimuli. Most of the existing literature is therefore systematically biased against the possibility of detecting a developmental stage at which children can understand relational terms when they express familiar relationships, but experience difficulty in using relational terms as the basis for establishing representations of novel relationships" (p. 324). It would appear then that the data supporting the componential model are incomplete, leading to an interpretation which has ignored at least one important variable. The hypothesis or prediction put forth by those supporting the contextual model, posits three steps occurring with increasing age when familiar and unfamiliar material is presented. At the first step we find poor performance with both types of content. At the second would be poor performance with unfamiliar content and good performance with familiar content. Finally, at the third step we would see good performance with both sorts of events.

French (1988) begins the discussion of the contextual model of the development of relational terms by stating that the "understanding of relational terms is initially context dependent, such that children can understand relational terms when they express familiar relationships, but experience difficulty in forming representations of novel relationships solely on the basis of linguistic input" (p. 262). Or, as presented by French and Nelson (1985), in the course of development "children become able to use the terms to posit or to comprehend novel and arbitrary relationships" (p. 92). Essentially what these researchers are saying is that children go through an early stage of development in

which they are completely context dependent and will only understand the term within an event sequence context which is familiar to them, i.e. one for which they have a mental representation. The child then goes through a stage of decontextualization in which he/she is no longer context bound but is able to understand the term in unfamiliar event sequence contexts .

As well as describing the developmental course that children follow in acquiring an understanding of relational terms, French (1986a) and French and Nelson (1985) also attempt to explain why and when this development occurs. French (1986a) discusses the fact that the language processing demands placed on an individual are different depending on whether or not the statement refers to a previously known event relationship. To comprehend statements representing familiar relationships, the listener uses the linguistic input to access an already existing mental representation of the events and their usual relationship. To comprehend statements representing unfamiliar relationships, the listener must use the linguistic input to form a mental representation of that relationship. Perhaps at an intermediate stage when a word's meaning is incompletely represented, children can use their prior knowledge of the likely relationship between two events to infer the full meaning of a relational term. If prior knowledge is not available, children must construct an event representation and assess it's probable relationships (assuming such an assessment is possible) before any inference about word meaning can be made. In short, familiar content allows the child

to go through a one step comprehension process as opposed to a two step comprehension process.

French (1988) presents a somewhat different version of the processing demand argument in a discussion of redundancy. She argues that word meanings in the intermediate state are fully represented but also that children have general difficulty processing decontextualized input. French (1988) states that "the lexical components of because and so are understood during the context dependent stage, and the transition from context dependent to context independent understanding does not reflect further lexical development, but rather increasing facility in dealing with decontextualized linguistic input" (p. 262). It is at this point of decontextualization that syntactic cues alone are sufficient and redundancy is no longer needed, e.g. between order of mention and order of events. It is assumed that by this point the child's cognitive development is such that he/she is able to deal with the higher cognitive demands placed on him/her when contextual cues are no longer available. Since researchers such as Kuhn (1978) and Bullock and Gelman (1979) have demonstrated basic understanding of the concepts of cause and order among preschoolers, the necessary cognitive development must involve some other, not yet understood, parameter of growth.

The contextual model of lexical learning provides a useful framework for interpreting some of the data on relational terms that were summarized earlier. Because the earliest studies did not use familiar context as a variable, the age at which the child comprehended without contextual support was typically the age

at which the child was said to have acquired an understanding of the relational term. This age was usually said to be at least seven or eight. Error patterns in these studies further indicated that the child could not demonstrate understanding of the relational term because he/she did not comprehend the temporal ordering component. When familiarity as a variable was introduced, those age groups which had previously not shown an understanding of the relational terms, began to do so. Researchers such as Lucia French and Katherine Nelson, using both elicited narrative data and experimental data, have demonstrated that preschoolers can comprehend and produce relational terms appropriately when given familiar contexts. In fact, Nelson (1986b) believed that a central finding in her research was that children as young as three are sensitive to the temporal structure of events and can correctly report sequences of familiar events. And French et al. (1983), in a review chapter documenting the effects of discourse content and context on young children's use of language, conclude that children between the ages of 2;11 and 5;6 demonstrate cognitive and linguistic abilities that have not been typically attributed to children of this age.

Factors Affecting Performance

The earlier review of previous literature makes it clear that context can play an important role in affecting a child's performance in comprehension and production of relational terms. French's study of because/so focuses specifically on one contextual

variable, content familiarity. This section will take an in depth look at various contextual variables and how they affect performance, particularly in comprehension of relational terms. Contextual variables will include both external variables, i.e. experimental factors under an investigator's control and internal variables, i.e. factors of a more cognitive nature (French 1986).

External Variables

External or experimental variables include things such as (1) Experimental Procedure or Paradigm type, (2) Stimuli, and (3) Experimental Setting. Each of these will be defined, discussed and problems arising from them will be explored.

Experimental Paradigm. A paradigm is basically a general type of experimental task which an individual being tested must perform and which gives a measurement of performance. There are a number of paradigms used in studies. Here, four paradigm types which are quite common in studies of comprehension of relational terms will be discussed along with their potential problems. The first paradigm type is grammaticality judgements (Emerson, 1979; Emerson and Gekoski, 1980). Here, children are asked to judge the grammaticality of a statement, i.e. whether it is being said the right way; is it a silly statement or sensible statement. Because these studies very often deal with preschoolers, adaptations need to be made and some investigators using this paradigm have asked children to select a "silly" or "sensible" puppet as the speaker responsible for each statement. The second type is an enactment paradigm (Clark, 1971; French and

Brown, 1977; Kavanaugh, 1979; Bebout et al., 1980; French, 1988) in which children are asked to act out a statement containing the term. A third type of paradigm is one in which children are asked questions containing the target term (Clark, 1971; Carni and French, 1984). An example of this would be a sentence completion task (French, 1988) in which an individual is given the first part of a sentence containing the relational term and must complete that sentence. An example would be "He started crying because ...". The fourth paradigm type is a picture selection task (Coker, 1978; Emerson, 1979; Emerson and Gekoski, 1980) in which children are asked to select the correct picture or picture sequence depicting the sentence. As a variant they might be asked to order a picture sequence to match a sentence containing the term (Emerson, 1979).

Unfortunately for investigators there are a number of problems with these paradigms. One group of problems is known as secondary task demands. In studies on comprehension of relational terms the investigator is trying to discover whether or not a child understands the term in question and therefore comprehension of the term would be considered the primary task of the child. However, the paradigm used may require more than knowledge or comprehension of the term in order for a correct answer reflecting knowledge to be observed. The paradigm or task may require the individual to possess other abilities which may or may not be beyond his/her capabilities. This may depend on the age of the child or other factors. "Comprehension paradigms inevitably involve various secondary task demands in addition to the primary demand of comprehending a particular term, and the children who do understand

the term under consideration may fail to demonstrate this competence if they are unable to comply with a secondary task demand" (French and Nelson, 1985, p. 84). Examples of secondary task demands include the ability to distinguish pictures, to point, and to manipulate toys. These particular task demands would more than likely be noted, but there are many more which are less easily detectable. Such a demand exists in the grammaticality judgement paradigm in which a child must reflect upon lexical knowledge, i.e. must possess metalinguistic skills. Such a paradigm might lead to the underestimation of a child's knowledge of the relational term in question because this secondary task demand is more difficult than the primary task demand of understanding the term. Another secondary task demand exists in the enactment paradigm and that is the realization that one must act out two parts or events. A child might leave out one of the parts or wait for approval before acting out the second part. French and Brown (1977), for example, found that the errors made in this task tended to involve omitting the second event. They suggested that this did not necessarily indicate a lack of comprehension but may have occurred because the child thought he/she was to wait for feedback before acting out the second part. A final example of a secondary task demand was described by Emerson (1979) within a picture selection or picture sequence task in which children may lack knowledge of conventional ordering rules.

For any comprehension paradigm in which the secondary task demand is more difficult than the primary task demand, an underestimation of the child's ability will result. More often

than not, there will be a number of secondary task demands for any given paradigm, a fact that has lead to French (1986) and French and Nelson's (1985) observation that a pure measure of comprehension would be extremely difficult to obtain.

When a child is faced with a task that is too demanding, whether it be difficulty in comprehending the term itself or difficulty with the secondary task demands, he/she often has coping strategies which help him/her deal with the task. According to French and Nelson (1985) coping strategies can be either linguistic or non-linguistic. An example of a linguistic coping strategy is one used in enactment paradigms in which greater attention is given to the main clause. This may be used by children who are having trouble processing or remembering two connected clauses. In effect, the use of memory or processing skills is a secondary task demand which, if too great, causes the implementation of a selectional coping strategy. Use of this strategy could cause an underestimation of the child's knowledge of the term.

Examples of non-linguistic strategies that preschoolers tend to adopt include following the order of mention in enactment, following a systematic pattern such as alternating between left and right in picture selection tasks, or attributing all statements to one favourite puppet in a grammaticality judgement paradigm. Coker (1978) notes that "task requirement variables seem critical in determining when a particular strategy will be used" (p. 274). French (1986) further suggests that children who have already developed some of the lexical knowledge may still be using certain strategies. The child's use of a strategy is not necessarily

affected by whether or not he/she knows the meaning of the term. French (1986a) states that "the factors governing the use of a particular strategy may be too powerful to be counteracted by lexical knowledge alone, so a lexically irrelevant response strategy may persist even when the child has the relevant lexical knowledge" (p. 316). If this were the case then a child's knowledge of terms would again be underestimated.

In order to illustrate the effect of paradigm type on performance, comparisons need to be made within and between studies looking at comparison of findings when differing paradigm types are used. Consider the conflicting results as to which relational term is acquired first, before or after. Clark (1971) using an enactment task concluded that before was acquired before after. Carni and French (1984) use a task in which children heard stories and answered questions containing before or after e.g. "What happened before ...?", and found just the opposite, i.e. that after was acquired first. As French (1986a) observed, if either claim were true then the same pattern of performance should be seen across different tasks.

Pamela Coker (1978) did a direct comparison of performance on three different tasks: (1) picture selection, in which the child was shown three pictures and asked "What did I show before/after the X?" (2) sentence selection, in which the child chooses the sentence containing the correct term to match a picture sequence, and (3) sentence enactment. Her results indicated that children earned the highest scores on the first task, and the lowest scores on the third. As mentioned earlier, Emerson (1979)

also compared two paradigm types. The first task was one in which the child had to choose one of two picture sequences to match a sentence containing because. The second task involved sequencing two pictures to match the event order in a sentence containing because. Emerson found that performance on the first task (picture sequence task) was significantly better than on the second task (first/last task). Finally, French (1988) replicated the findings of Bebout et al. (1980) using an enactment task with three sentence types. Both investigators found that children in earlier grades made more errors overall and more errors with sentence type "Y because X" than "because X,Y" or "X so Y". However, when French used a sentence completion task, performance for "Y because X" was no poorer than for the other sentence types. In the absence of detailed language performance models, it is difficult to formulate specific explanations for any of the discrepancies in these three direct tests of paradigm effects, but there seems little doubt that they are related to task variables.

Stimuli. Another variable which affects a child's comprehension of relational terms, and which is under the experimenter's control, is the stimulus. In general terms a stimulus is the specific object or material used to elicit a response. For example, the stimulus could be the sentence or story which is read to the child and to which the child responds in order to demonstrate knowledge of the relational term in question. There are a number of variations in the stimulus that will affect performance. An obvious example would be the relational term used.

It has been suggested (French and Nelson, 1985) that certain relational terms are comprehended earlier than others. The fact that research on the terms before and after has occurred more often with preschoolers than research on the terms because and so may reflect this opinion among researchers.

Other variations in the stimulus concern the type of language used. Experimenters may use stories or sentences. When a story is used the whole story must be retained before comprehension can be demonstrated. If a child fails an item, it is unclear whether the child does not comprehend the term or simply does not remember the story. Sentences are certainly shorter and therefore memory is less of a problem. But there are also linguistic variations at the level of the sentence. For one, position of clauses within a sentence needs to be considered. For example, when the relational terms before, after, and because are used in a sentence, the position of the clauses may be switched. If there are two clauses X and Y, where X refers to an event which naturally comes before event Y or is the cause of Y, then the possible sentence types are: (1) X before Y (real world order of events is preserved) (2) Before Y, X (3) Because/after X, Y (real world order of events is preserved), and (4) Y because/after X. The position of the clause may affect the child's performance, raising questions as to whether the child is truly able to comprehend the relational term in question.

According to Coker (1978) there are two possible strategies that a child may use or adopt when interpreting before and after (used as subordinating conjunction): (1) a syntactic

strategy in which attention is directed toward the main clause, and (2) a semantic strategy in which the order of mention is interpreted to correspond to the actual order of occurrence. If these strategies were in use then certain results would be expected. For example, children would perform better on items in which real world order of events is preserved, or, in an enactment task, children might act out only one clause. We have seen that Eve Clark (1971) found that before/after sentences in which the order of mention violates the real world order of events, elicit more errors than the other sentences. Similar findings have been reported by French and Brown (1977) for before/after and by Bebout et al. (1980) and French (1988) for because/so.

Finally, one of the most confusing aspects of stimulus variation concerns the nature of the logical or physical contingencies that can occur between the events mentioned in the two clauses. Take for example, the events mentioned in the sentence "He fixed the car before going to the store". One could reverse the sequence of events and say "He went to the store before he fixed the car" and the sentence would still make sense. Not all event sequences can be plausibly reversed, however. "He put his keys in the ignition before starting the car" is a 'non-reversible' sentence since it would be unlikely that one would be able to start the car before placing the keys in the ignition.

Unfortunately, studies that look at the event contingencies between clauses tend not to use the same terminology and/or definitions. Some examples of the terms used and comparisons made are "logical vs arbitrary sequences" (French and Brown, 1977),

"reversible vs non-reversible" (Emerson, 1978) and "logically constrained vs logically reversible sequence" (Kavanaugh, 1979). All of the above researchers demonstrated that this variable influences performance such that performance with "logical", "non-reversible" and "logically constrained" sentences was significantly better than with "arbitrary", "reversible" and "logically reversible" sentences, respectively. I will return to consider this variable from the perspective of the child in a later section.

Experimental Setting. The experimental setting is a broad term and in fact overlaps with both paradigm type and stimuli. However, to keep things simple the setting can refer to a natural environment as opposed to an experimentally controlled environment. This does not necessarily indicate a difference between spontaneous production and elicited production but can also refer to a child's natural environment compared to an environment that has been set up by a researcher and is thus unfamiliar to the child.

Internal Variables

One of the most important set of factors affecting a child's production and comprehension of relational terms involves internal variables. Broadly speaking, an internal variable is one that cannot be controlled by the experimenter, and depends upon the child's own knowledge and ability.

Test-taking Skills. French and Nelson (1985) and French (1986a) discuss one sort of internal variable, i.e. the test taking

skills of the child. These skills include paying attention, following instructions, seeking clarification for unclear instructions, trying to reach the correct answer and trying to deduce the test givers underlying intentions. These skills are primarily developed when a child goes to school and therefore it is unreasonable to expect a preschooler to have developed these skills. Problems can therefore easily arise when interpreting performance failures.

Event Knowledge. The most important set of internal variables for this study concerns the child's event knowledge. It can best be described by first giving definitions to four basic constructs used by current cognitive psychologists. One investigator who has studied this topic in great detail is Katherine Nelson. The focus will therefore be on her definitions and explanations.

The four terms to be defined are schema, script, event representation and scene. A schema, according to Katherine Nelson (1985), "specifies essential elements in spatial, temporal or causal relations to one another as well as elements that may be optional" (pg.38). A schema represents knowledge. "For example, a living room schema specifies essentially four walls, a door, and windows" (pg.38). This type of schema is known as a scene schema. There also exists event schemas, an example being "getting ready for school". An event schema is essentially what is known as a script. A script, according to Nelson (1985), "is a schema specifying a sequence of actions related temporally and causally"

(pg.40). A script is also a form of an event representation which is defined by Nelson (1985) as "an abstract skeletal structure, one from which concepts of objects, persons and actions can be derived and on the basis of which relationships can be defined" (pg.208). Nelson (1978) also described scripts as "models of familiar experiences that are called into play in the appropriate verbal or situational context" (pg.256). Finally, Nelson (1985) defines a scene as "a coherent series of actions that take place in a single setting, involving the same goal, people and objects" (pg.41). What is sequenced in a script are its scenes.

It is easy to get confused by the various definitions and where they stand in relation to each other. However, Nelson (1985) tied these terms nicely together when she stated "the child's earliest event representation or script includes action schemes such as throwing, banging and much more: objects, persons and person's roles and sequences of actions appropriate to a specific scene". "It includes the specific social and cultural components essential to carrying through a particular activity" (pg.42). Nelson then uses the terms (general) event representation and script to mean essentially the same thing. At least for the purpose of this study they will be used interchangeably.

The idea of a script or general event representation is important when dealing with a child's development of both cognition and language. A child begins to develop scripts very early on in his/her development. In fact, Nelson (1985) feels that children even at three years of age know a lot about the activities they are involved in and can even talk about them. Scripts are learned and

the product of experience. Children, through participation, learn the script or develop a general event representation. This does not mean that a child participates once in a series of events and automatically develops a complete script for the events. An incomplete script or general event representation would occur when important characteristics of the event structure (i.e. series of events in a hierarchy) are not represented. Nelson (1985), in describing the initial stages of script development, states that "the initial event representation is represented as an unanalyzed whole on the basis of the child's participation in (or observation of) an activity, such as eating lunch" (pg.43). For example meal time is understood as a whole event, not a series of discrete events. A child may realize that setting out the bowl is a part of the whole, but does not explicitly represent any causal or temporal relationships. As the child experiences more of the same series of events, he/she becomes more familiar with them and develops more complete scripts, increasing his/her knowledge base.

General event representations play an important role in language comprehension and formulation processes. Children, and adults, use scriptal knowledge to read between the lines of spoken discourse and to organize their own comments on specific events. For example, the sentence "We almost missed the movie because of the popcorn line", makes much more sense to a listener who is familiar with the typical chain of events at a cinema than to someone who is not. Children who have already developed a script they can use to help them understand a particular sentence will be more successful than those who have no applicable script. This

seems to have been the basic idea that has lead to the experimental manipulations of 'context' that were described earlier. Experimenters vary the content of the clauses joined by relational terms, but what is really being manipulated is the degree to which the child can rely on their general event knowledge to interpret the likely relationship between the clauses.

It is important to note here that at least two different factors actually determine the child's use of event knowledge: (1) the nature of the child's past experience, i.e. familiarity with the events, and (2) the nature of the events, i.e. real world event contingencies. Events which have no inherent temporal, physical or logical relationship are much less likely to reoccur in the same sequence and thus to be organized into scripts. It is obvious that a child must have had considerable experience with a particular sort of event sequence in order to create the abstract cognitive scheme. But, although familiarity with a sequence implies inherent contingencies, the converse is not true. Moreover, a set of specific events could each be highly familiar but still not be organized into a predictably ordered sequence. There has been considerable confusion in the literature on these points. For example, Carni and French (1984) stated that the comprehension of the relational terms before and after would vary depending on whether or not the relationship being described was already "familiar" to the child. The actual comparison in their experiment, however, was between invariant and arbitrary real-world temporal orders. The assumption was that children had prior knowledge of the invariant sequences. The problem, of course, is

that not all children would necessarily be familiar with or have a knowledge base for a particular invariant sequence. French and Brown (1977) had previously compared logical and arbitrary sequences in which 'logical' was considered to be a meaningfully ordered sequence. The result was that performance was superior for meaningfully ordered sequences. However, the problem again is that not all logical sequences would necessarily be familiar, hence meaningful.

French (1988) appears to be the closest investigators have come to looking at familiarity as an influencing variable with the terms because and so. Recall that French (1988) specifically compared familiar with arbitrary relationships and did not distinguish between familiarity and event contingency, i.e. her familiar events were not only familiar but were sequences with inherent temporal and causal links. Moreover, the tasks used to assess comprehension of the familiar and arbitrary conditions differed. A sentence completion task was used for familiar content items and an enactment task was used for arbitrary content items. Because task type in itself influences performance one can not be certain whether a difference in performance was due to task differences or difference in familiarity with the content. It is also unfortunate that French limited her study to school age children. This may be in part due to the fact that she, like other investigators, simply did not believe that preschoolers would demonstrate any significant comprehension of these terms. Corrigan (1975) and Emerson and Gekoski (1980) had come to the conclusion that children under the ages of seven or eight do not yet

comprehend the term because. These investigators had not, however, looked at familiarity or script knowledge as an influencing variable. In short, although there are good reasons to believe that familiarity with certain sorts of event sequences will lead to the creation of scripts and thus affect young children's understanding of sentences that contain relational terms, this possibility has not yet been adequately studied.

Memory. Memory is another internal variable that can affect task performance. Carni and French (1984) suggest that when a child is confronted with a sequence for which a question is asked, he/she can respond correctly in one of two ways. First, the child can memorize the sequence and answer questions by referring to the resulting representation. Secondly, the child can refer to an already existing depiction or representation and give an answer. If a child does not already have a mental representation of the event then the first method is the only one open to him/her. As discussed earlier, the script is the developing framework for event memory. The child who has no mental representation for a specific type of event (i.e. is unfamiliar with that event) will have nothing to help him/her remember a story for which he/she must answer questions. This will be particularly problematic for younger children who tend to rely more heavily on schematic structures than do older children. "Without a general schema to guide recall children should have difficulty remembering a novel episode" (Slackman as cited in Hudson and Nelson, 1986, p. 256).

A younger child might, for example, have difficulty remembering the order of the mentioned events leading to an incorrect interpretation of cause and effect (Brown, 1975b). Or, although the child may understand the relational term used in a story, he/she may not recall enough of the story to adequately answer the question. Given a familiar event sequence, the child is no longer required to recall the correct order of events so performance improves.

An older child who has no mental representation for the event will most likely have a more sophisticated memory system. These additional resources may make it possible to demonstrate an understanding of the relational term in question (Brown, 1975; Nelson, 1985). Although there is little doubt that older children remember more than younger children, the nature of the memory change that makes this possible is controversial. Memory theorists such as Michelene Chi (1978) would agree with Hudson and Nelson (1986), however, in drawing a connection between memory performance and the knowledge base: the greater the knowledge base, the greater is memory performance. While the evidence showing relationships between a child's knowledge base and performance on memory tasks seems strong, some questions remain, especially in regard to tasks such as those used to assess a child's comprehension of relational terms. Does familiarity improve performance because prior knowledge makes it easier to remember the nature of the component events, and thus frees the child to focus on linguistic processing of the relational term? Or, does

familiarity improve performance because prior representation of an event sequence allows the child to figure out what a new term means. One way to begin to choose between these alternative interpretations would be to provide external memory assistance, e.g. to add pictorial cues, specifically pictorial sequences depicting the verbal sequences. Children who know the meaning of the relational term should improve their performance when they do not need to struggle to recall the nature of the individual events. If, on the other hand, children do not know the meaning of the term, they may fail to comprehend even with an external memory cue since recall of the events alone does not specify their antecedent/consequent roles.

Conclusion and Research Questions

Although researchers now are much more aware of the many influencing variables effecting production and comprehension of relational terms there still exists a number of problems. French (1986a) makes the comment that there are two problems that exist with the literature and they are that it is fragmented and uninterpretable. French came up with four reasons why she felt this to be so. First, each term or pairs of terms tend to have their own separate literature such that connections are not made to other terms. Secondly, all have their own specific questions so that at times it is difficult to compare one study to another. Thirdly, terms can often be defined in more than one way.

Fourthly, investigators often look at either comprehension or production and do not attempt to co-ordinate data from both. It is also evident that the structure of the tasks used in studies has not been adequately changed so as to eliminate the excessive cognitive load placed on the child. As French and Nelson (1985) have commented "in a number of areas it has been found that careful manipulations of context reveal cognitive abilities among preschoolers that remained undetected using more traditional measures" (pg.86). One needs to consider in detail what a task is asking the child to do and what may be preventing him/her from successfully accomplishing the task. Variables such as familiarity with the event sequence need to be considered if we wish to come up with a developmental model that is most reflective of the course of a child's development in terms of comprehension and production of relational terms and the ages at which certain skills are developed.

Studies with an emphasis on contextual factors have allowed for a new view of development, one in which decontextualization rather than (or at least in addition to) sequential mastery of different abilities is the key element of change. To end on a more philosophical note, I share the feelings of French and Nelson (1985), that no conclusions regarding cognitive or linguistic ability should be reached solely on the basis of failure to use or comprehend a term. One must also fully explore the child's competencies. The present study is motivated in part by a desire to understand young children's language

strengths. It looks at the comprehension of the relational terms because and so with preschool children and attempts to answer the questions:

1. Do preschoolers (3,4,and 5 year olds) demonstrate knowledge (in terms of comprehension) of the relational terms because and so? If so, does this knowledge increase with increasing age?
2. Is there a difference in performance between the terms because and so, i.e. do children demonstrate a knowledge of one term before the other?
3. Does familiarity with an event sequence (i.e. prior knowledge) affect performance on comprehension of the relational terms because and so?
4. Does the use of pictures (accompanying the event sequence) affect performance on comprehension of the relational terms because and so?

Chapter 3

METHOD

Thirty preschool children were read 16 stories that had either familiar or unfamiliar content and were presented either with or without pictures. Each child was asked to complete sentences containing the terms "because" or "so" regarding the stories.

Subjects

There were 30 subjects, 15 male and 15 female, in three groups of 10 at ages three, four and five. The age range for the age three group was 3:3 - 3:11 (mean age 3:6.5). The age range for the age four group was 4:0 - 4:9 (mean age 4:5) and the age range for the age five group was 4:11 - 5:8 (mean age 5:4). Criteria for subject selection were as follows:

1. age 3:0 to 5:11 at time of testing
2. normal language development (as determined by observations and interactions with children by preschool teacher and investigator)
3. English as a first language
4. normal hearing (as determined by routine preschool screening).

Tasks and Materials

Each child heard 16 brief stories of two types. Both concerned highly scripted events, i.e. events with invariable sequences. However, one set (eight stories) concerned events that were familiar to young children and the other set concerned unfamiliar events. For example, one familiar story concerned "getting ready for bed" and depicted the sequence of events involved in getting ready for bed. One of the unfamiliar stories concerned "fixing a flat tire" and depicted the sequence of events involved in fixing a flat tire. All stories were five to six sentences long. There were accompanying pictures for half the stories read to each child, one picture for each sentence of the story. Complete texts for the stories are provided in Appendix A.

Following each story, children were asked to do a sentence completion task. The sentence completion items were in one of two forms; "Y because ..." and "X so ...", in which X was an antecedent event/state and Y was a consequence event/state. Examples included "Jimmy is having a party because ..." and "Everyone is hungry so ...". Both "because" and "so" items were designed such that there was both a possible antecedent and a possible consequence answer available in the story for each item so as not to bias the child's answer one way or the other. For example, in the case where a consequence Y was given and the child was to complete the sentence with an antecedent ("Y because..."), it was possible to complete it with a consequence should the child either mix up "because" and "so" or not understand the term in

question. To illustrate this feature of the stimuli, consider the "getting ready for bed" story. The consequence question was "Johnny's mommy reads him a story because ...". The appropriate answer involved an antecedent such as "because he likes books". However, a child who mixed up the two relational terms and considered it an antecedent question could just as easily find a consequence such as "so he falls asleep". The same type of options were available for the cases in which the antecedent X was given ("X so ..."). Questions for each story are provided in Appendix B.

Procedure

Instructions prior to testing were given as follows:

"I am going to tell you some stories. I want you to listen carefully because I'm going to ask you some questions at the end. Let's try some practice stories first". Two practice stories were presented to familiarize the child with the sentence completion format. One of the practice stories went as follows:

1. Johnny is walking with his daddy.
2. They are walking to the store.
3. Johnny is going to buy ice cream.

The sentence completion questions regarding this story were :

1. Johnny is walking with ...
2. They are walking to ...
3. Johnny is going to buy ...

For the first trial story the examiner was allowed to help the child reach an answer. For the second story the child was required

to answer questions on his/her own. Only those children who demonstrated understanding of the sentence completion task by appropriately answering the questions for the second trial story were allowed to move on to the experimental task proper. All children who entered the study were able to meet this criterion.

Before each story was read the child was asked if he/she was familiar with the experiences that made up the content of that story. The question was asked in the form "Have you ever ...". All but one of the children said that they indeed had no first-hand experience with the events described in the "unfamiliar" stories, and did have experience with the events in the "familiar" stories. The one child who reported an unusual history of experiences was dropped from the study and replaced.

Each child received one of two test batteries presented over two sessions. He/she was seated at a small table, or on the floor, in a quiet part of the daycare and listened to 16 stories, 8 in session #1 and 8 in session #2. Half of the stories were accompanied by pictures (five to six pictures per story) which were presented and removed, one at a time as the story was being told. Also, the content of half of the stories was meant to be familiar to the child while the content of the other half was unfamiliar. Presentation factors were combined such that each child was presented with four stories in each of four conditions: 1. familiar sequence with pictures (FP), 2. familiar sequence without pictures (FNP), 3. unfamiliar sequence with pictures (UP), and 4. unfamiliar sequence without pictures (UNP).

Each child was read the same 16 stories. However, a given story was presented to half of the children in each age group in the NP (no picture) mode and to the other half of the children in the P (picture) mode, to avoid confounding story content within mode of presentation. This created two story test batteries. Within each test battery the order of presentation of the stories was randomized. Since, within each battery, a given story was assigned to a presentation mode, randomization of the stories effectively randomized order of presentation for the four conditions.

After each story the child was asked to complete two sentences, each of which contained the relational term "because" or "so". The two sentence completion items presented after each story were each randomly designated as containing the relational term "because" or "so", with the constraint that there be equal numbers of "because" and "so" questions in each of the four conditions. There were then three possible combinations of sentence completion items per story. These included: (1) two items containing "so", (2) two items containing "because", and (3) one item containing "so" and one item containing "because". Designation of question type was made by test battery item number rather than by individual story number, with the consequence that a given story did not necessarily have the same type of sentence completion items in the two batteries.

Scoring

Answers to questions were hand recorded on a score sheet. When the child answered a sentence completion item correctly he/she was given a score of 1; otherwise a score of 0 was given. There were certain criteria for what was considered an acceptable or unacceptable answer. To earn a score of 1, the child's answer had to reflect knowledge of the relational term in question. That is, the child had to answer with an antecedent when given a consequence ("because") and answer with a consequence when given an antecedent ("so"). The answer did not necessarily need to be grammatically correct nor did it have to specifically refer to the story. However, the response did need to be a logical antecedent to the consequence or a logical consequence to the antecedent. All other answers were given a score of 0, including statements that the child did not know the answer or failures to respond even after prompting.

CHAPTER 4

Results

The purpose of this study was to investigate the effect of familiar event context and pictorial cues on the comprehension of the terms because and so. The primary data analysis consisted of a four-way repeated measures ANOVA, Age (3) X Familiarity (2) X Pictures (2) X Lexeme (2), with Age treated as a between subjects variable and the other factors treated within subjects. The dependent variable was number of correct responses (maximum=4 in each cell). Responses were scored as correct whenever the child was able to complete the sentence with an appropriate antecedent when given a sentence with the term "because" or an appropriate consequence when given a sentence with the term "so". Appropriateness of content was judged generously, within each story framework.

The ANOVA indicated significant main effects for the variables of Age and Familiarity. There were also two significant interactions, Picture X Lexeme, and Familiarity X Picture X Age. These significant interactions indicate that differences attributable to a change in the first variable are not the same for the different conditions in the second and subsequent variables. The ANOVA indicated no further reliable group differences.

Age Effect. Across the variables of Familiarity, Lexeme and Pictures, five year olds had a higher mean number of correct answers (2.5) than the four year olds (2.14) who in turn had a higher mean number of correct answers than the three year olds (1.40). The ANOVA indicated that at least one of these group differences was statistically significant, $F=11.74$; $df=2,27$; $p<.001$. This result indicates that comprehension of the relational terms because and so improves with age.

Familiarity Effect. Across Age, Lexeme and Pictures, the mean number of correct responses was significantly greater for familiar (2.9) than unfamiliar (1.13) material, $F=206.12$; $df=2,27$; $p<.0001$. This finding indicates that children's comprehension of relational terms will be stronger in the context of familiar content.

This interpretation of the Familiarity Effect was supported by children's response to the interview questions regarding past experience with various sorts of events. With few exceptions, the children indicated that the "familiar" stories did indeed focus on events that fell within their experience, while the "unfamiliar" stories did not.

Picture X Lexeme Interaction. The presence of pictorial cues had a different effect for the two relational terms. There was a higher number of correct answers with the pictures than without the pictures for the term because (2.18 vs. 1.80). An opposite, and similarly sized, effect was seen for the term so (1.92 vs. 2.15). Although the absolute size of these differences

was small, the interaction was statistically reliable, $F=11.11$; $df=2,27$; $p<.01$. This finding provides partial support for the hypothesis that picture cues would improve performance by reducing memory demands.

Familiarity X Picture X Age. Finally, there was a statistically reliable interaction between familiarity and the presence of pictorial cues that changed in character with age, $F=3.69$; $df=2,27$; $p<.05$. The pertinent group means are provided in Table 1. As can be seen, for the three and five year olds, pictures led to improved performance on the familiar material, but not the unfamiliar material. For the four year olds, however

AGE	MATERIAL	PICTURES	NO PICTURES	COMBINED
3 Yr.	Familiar	2.45	2.15	2.30
	Unfamiliar	.40	.60	.50
4 Yr.	Familiar	3.00	3.25	3.13
	Unfamiliar	1.35	.95	1.15
5 Yr.	Familiar	3.40	3.15	3.28
	Unfamiliar	1.70	1.75	1.73

TABLE 1. Mean correct responses for familiar and unfamiliar material, with and without pictures, at three different ages.

pictures led to improved performance on unfamiliar material, but not familiar material. Again, this finding provides only partial support for the hypothesized role of pictorial cues.

As a follow-up to the significant effects for Age and Familiarity, correct responses to questions about the familiar stories were analyzed on a child by child basis. The goal of this analysis was to determine how many children in each age group "knew" the terms because and/or so in the context of familiar, scripted events. Children were required to make 6 out of 8 (75%) correct responses in order to be credited with knowing the meaning of a term. The results of this analysis are given in Table 2. As can be seen, half of the three year olds, and all of the four and five years olds demonstrated knowledge of either or both terms. There was no strong evidence that one or the other term was consistently acquired before the other.

AGE	BOTH TERMS	ONLY BECAUSE	ONLY SO
3	2	2	1
4	5	3	2
5	6	1	3

TABLE 2. Number of children with at least 6/8 correct answers to "because" questions, "so" questions, or both, with familiar, scripted story content.

A qualitative analysis of responses was also done in which errors children made were classified, and their frequency of use recorded, for each age group. Their distribution within the variables of familiar vs non-familiar and picture vs no picture was also noted. Some seventy percent of the errors fell into one of seven error patterns, three involving confusions between antecedent and consequent events, one involving general appeals to necessity, two involving failures to provide self-generated sentence completion material, and one consisting of failures to respond. The results of this analysis are summarized in Table 3.

The first error pattern involved answering because questions as if they were so questions, i.e. giving a plausible consequence when an antecedent was required. Overall some 6% of the errors were of this type (26 out of 474 errors), with the lowest rates seen among the three-year-olds. This error type appeared to be evenly distributed between familiar and unfamiliar contexts as well as between items with pictures and no pictures. In some cases children added the term "so" when such errors were made. This occurred in 67% of the Type 1 errors made by the four- and five-year-olds, but was not seen among the three-year-olds. Except for a four-year-old who made 8 Type 1 errors, the 16 children who responded to because questions in this fashion did so only once or twice each.

The second error pattern involved answering so questions as if they were because questions, i.e. giving a plausible antecedent when a consequence was required. Overall some 8% of the

errors (40 out of 474) fell into this category, with no differences in rate among age groups. In approximately 80% of the Type 2 errors the children actually added the term because. There appeared to be no particular situation or circumstances in which a child made this error type, i.e. errors seemed to be randomly distributed between familiar and unfamiliar context as well as picture and no picture situations. Of the thirteen children making Type 2 errors, 6 did so on as many as 4-5 occasions. Only one of these children was a five-year-old.

Comparison of the Type 1 and Type 2 error data revealed that most of the children responding in this fashion made one or the other sort of error, rather than both (19 vs 5 children). Eleven children, primarily five-year-olds, made Type 1, but not Type 2, errors; eight children, primarily three year olds, did the reverse.

On some occasions, children provided virtually identical answers to both questions for a given story, neither of which seemed appropriate. For example, within the story "A Car Accident", one child gave the response "she fell down" when answering the sentence completion questions "the police ask Nelly questions because ..." and "Nelly tells the police her name and phone number because...". This sort of response was categorized as error Type 3, and accounted for some 7% of the errors overall. As can be seen in Table 3, older children were less inclined to make this sort of error, probably due to the increasing likelihood that they understood at least one of the relational terms.

Another common error among the three year olds consisted of recurrent general appeals to affective states. For example, one child explained that: Jennifer gets a special award because..."she likes to get awards." Another child explained that "she needs to do that." Answers of this sort, when used more than once by a given child, were classed as error Type 4 and comprise some 4.5% of the errors overall, virtually all of them being produced by the youngest children.

The fifth and sixth error types involved children's repetition of the content of the question, Type 5, or some

TABLE 3. Distribution of errors by age and type.

TYPE	1 ^a	2	3	4	5	6	7
3 Yr.	2 ^b	8	10	9	8	8	26
	<u>4</u>	<u>17</u>	<u>21</u>	<u>19</u>	<u>16</u>	<u>17</u>	<u>55</u>
4 Yr.	10	10	6	1	<1	12	32
	<u>14</u>	<u>14</u>	<u>9</u>	<u>2</u>	<u>1</u>	<u>17</u>	<u>47</u>
5 Yr.	7	8	3	0	2	23	20
	<u>8</u>	<u>9</u>	<u>4</u>	<u>0</u>	<u>2</u>	<u>27</u>	<u>24</u>
All	5	8	7	4	6	13	27
	<u>26</u>	<u>40</u>	<u>34</u>	<u>21</u>	<u>28</u>	<u>61</u>	<u>127</u>

a Type 1: give consequence instead of antecedent Type 2: give antecedent instead of consequence Type 3: undifferentiated Type 4: appeal to affective state Type 5: repeat content of question Type 6: repeat portion of story Type 7: "don't know" or no response

b Percentages; raw frequencies are given in italics.

inappropriate portion of the story, Type 6, as responses to the sentence completion items. For example, for the item "Peter and his brother are making a lot of noise so...", the answer under classed as error type 5 would be "they're making a lot of noise." Overall, some 6% of the errors were of this type (28 out of 474), most provided by the three-year-olds, especially on so items. In contrast, answers utilizing near-verbatim, but inappropriate, portions of the story, Type 6, were more frequent among the older children. Thirteen percent of the errors overall fell into this category, but it comprised 23% of the errors made by five year olds.

The seventh error type consisted of failures to respond, including responses such as "I don't know", "don't remember", and "too hard". Overall some 27% of the errors were of this type (127 out of 474), with the four-year-olds showing the highest rate (32%), and the five-year-olds the lowest (20%). Unfamiliar context increased the use of this error type within both of these groups.

In summary, the results of this experiment indicate that preschoolers can in fact demonstrate knowledge of the relational terms because and so, and are more likely to do so with increasing age. Prior familiarity with an event sequence significantly improved children's ability to complete because/so statements about those events, but pictorial support did not improve performance in any consistent fashion. Analysis of the grouped data did not reveal a difference in success rates for because and so items, either overall or at specific ages. The error pattern data did suggest

some weak tendency for younger children to respond with antecedents and older children to respond with consequents.

CHAPTER 5

Discussion

This study looked at the comprehension of the relational terms because and so by preschool children (ages 3, 4, and 5), along with two variables believed to affect this comprehension - familiarity of content and presence of pictures. Children were read stories filled with sequences of inherently contingent events, the sort that are likely to lead to mental scripts. Half of the stories concerned events that preschoolers were likely to be familiar with, half did not. It was anticipated that the familiar material would lead to higher success rates with subsequent sentence completion probes involving because and so. To further explore the mechanisms of this facilitation, half of the story presentations were accompanied by pictures, half were not. If familiar event schemes are useful simply because they aid memory, then providing a different sort of memory aid might make unfamiliar stories likewise memorable.

The specific research questions that guided this project were as follows:

1. Do Preschoolers demonstrate knowledge (comprehension) of the relational terms because and so? If so, does this knowledge increase with increasing age?
2. Is there a difference in performance between the terms because and so, i.e. do children demonstrate a

knowledge of one term before the other?

3. Does familiarity with an event sequence (i.e. prior knowledge) affect performance on comprehension of the relational terms because and so?

4. Does the use of pictures (accompanying the event sequence) affect performance on comprehension of the relational terms because and so?

Basically, four different independent variables were investigated and results obtained as to their significant influence on a comprehension task. Results indicated that of the four variables only two had significant main effects, Age and Familiarity.

In the following sections, an attempt will be made to explain why there were significant main effects for both Age and Familiarity and why there were no significant main effects for Picture and Lexeme. There will also be some discussion of the two interaction effects observed, one involving Familiarity effects within each age group for pictured and unpictured items and the other involving Picture effects for the different lexemes.

Familiarity Effect

The fact that there was a significant main effect in which children performed significantly better on familiar material than on unfamiliar material, points to an acquisition process in which children comprehend relational terms in familiar contexts before they do so with unfamiliar material. It further suggests

that this phase of development for the terms because and so occurs between the ages of three and five. This might explain why some past studies (Piaget, 1928; Emerson, 1978; Emerson et al, 1980; Bebout et al, 1980) concluded that children did not comprehend the terms because and so until ages seven or eight. They, in fact, did not include the familiarity variable in their study and thus there was no opportunity for younger children to demonstrate their knowledge.

Now that the results indicate a familiarity effect, it is of interest to consider the reasons this effect might be occurring. In this study the unfamiliar stories presented the preschoolers with a very difficult task, to complete causal statements about events with which they had little real life experience. In such a task children had to sort out the vocabulary and the sequence of events, recall this new information, and formulate an appropriate answer, based not only on their understanding of the relational term but also on their understanding of the nature of the new events. For a school age child these may not be big challenges because even if the event material is new, he/she has enough skills, strategies or knowledge in the areas of memory, vocabulary, language comprehension, and sentence completion. A preschool child, however, may lack sufficient knowledge and/or experience in these areas to handle unfamiliar material. For example, the preschool child is likely to have a more restricted vocabulary and more laboured access to the vocabulary knowledge he/she does have. With limited resources, the preschooler may fail

to provide an appropriate answer, not because of his/her lack of comprehension of the relational terms, but rather because of his/her difficulty in understanding and remembering the nature of the unfamiliar story events themselves.

For familiar material, the preschooler can be expected to perform more successfully. Preschoolers develop a lot of their knowledge base through direct experience and repetition of those experiences. When children are read a story based on familiar events, they are likely to have event knowledge that can either assist in creating a representation of the meaning of the story, make such a representation less crucial in answering questions, or reduce the overall cognitive processing load entailed by the question answering task.

The context familiarity findings raise an interesting developmental question: When will there be no significant difference in performance between familiar and unfamiliar material, either due to high scores on both or low scores on both? In other words, at what point has the acquisition process not begun and at what point is it complete? We can now look at age effect in order to deal with this question.

Age Effect

In many studies dealing with children there is an age effect, most obviously because as children grow older they become more accomplished in different tasks and skills. However, it may be that children do not obtain a specific skill until a certain

age, in which case any difference in scores for children younger than that "age of acquisition" would be insignificant, as all of the scores would be very low or at chance level (depending on the task involved). The fact that the task involved in this study did not require a multiple choice or yes/no answer makes it difficult to determine a "chance level," or to otherwise decide whether a low, non-zero performance indicates early lexical knowledge or merely lucky guessing. However, in this study children did significantly improve performance as they got older, which is an indication that the acquisition process for the comprehension of because and so had begun at least by the age of four.

The question one then asks is whether or not this is in conflict with the findings of other investigators (Piaget, 1928; Emerson, 1978; Emerson et al, 1980; Bebout et al, 1980) in which comprehension was not evident until ages seven or eight. As mentioned above, one possibility is that these different findings reflect the effects of different task related variables such as familiarity of content.

Perhaps a more interesting point, however, concerns the nature of lexical acquisition. The current data seem to suggest that it is inappropriate to think about a 'specific point' at which acquisition suddenly occurs. Rather, there is an age period, in this case several years long, during which performance on particular terms continues to improve. This can be seen quite clearly in the individual performance data from the current project. In the context of stories about familiar events, half of

the three year olds, and all of the four and five year olds, answered 75% (6/8) of the questions for one or both of the terms because or so. None of the three year olds and only two of the four year olds even approached this level of performance on stories with unfamiliar content. Four of the five year olds, however, succeeded in 10-12/16 of these more difficult, unfamiliar, items.

Such data would support claims that there is an increase in lexical knowledge with age, i.e. that children's knowledge of a given term somehow alters over time. From this viewpoint, one could speak of 'partial' versus 'complete' knowledge of the relational terms because and so in preschool children. The data would also support the somewhat different claim, suggested earlier, that changes in performance on comprehension tasks with relational terms reflect differences in event knowledge rather than differences in lexical knowledge. These two possible sorts of development will be discussed further in a later section.

Picture Effect

Contrary to the prediction made, the present results did not indicate a main effect for Pictures on performance. In other words, adding pictures to the story did not significantly affect performance across the board. It is, however, important to recall that there were two significant interaction effects involving the Picture variable. First, the influence of familiarity was not the same for the three age groups and the two picture conditions. Familiarity effects were greatest for the three year old group with

the aid of pictures and the four year old group without the aid of pictures. Second, the result of providing pictures with the stories differed for the two lexemes. Whereas the addition of pictures seemed to have the effect of slightly increasing correct responses for because, it had the opposite effect for so. An attempt will now be made to explain the absent main effect and the observed interaction effects.

One possible explanation for the absent main effect, of course, lies exactly in the interactions. When calculating a main effect the opposing effects for because and so would have been combined, averaging out to the apparent lack of a picture effect.

A second explanation for the absence of a main effect revolves around who the pictures were being presented to and how. It is possible that pictures only make a significant difference with those who hit attention/memory capacity limitations. In the familiar mode, there may not have been significant improvement because children's prior event knowledge brought the task well within processing constraints. For the unfamiliar context, processing limits may have been reached, but one showing of the pictures may not have been enough to aid performance.

This processing interpretation is compatible with the observed three way interaction between Age, Familiarity and Picture. For the three year olds, it seems likely that all aspects of the task were demanding. Nonverbal cues to meaning may have been useful only if the child also had prior knowledge of the events, i.e. if the stories were about familiar events. For

unfamiliar content, the pictures could not assist performance, and may even have been detrimental. If so, the net effect of the pictures would be, as observed, to heighten the familiarity effect. The four year olds, on the other hand, could perform near ceiling for familiar material without the pictures. In these circumstances, the pictures might mean only distraction. For unfamiliar material, however, the nonverbal cues might begin to be useful. The net effect of these influences would be, as observed, to diminish the basic familiarity effect.

These developmental trends may be somewhat obscured by the manner in which the pictures were presented. The pictures were not left in front of the children for them to use as references when answering the questions, but rather were placed down and taken away, one at a time, such that not all were seen at once. This method of presentation may have reduced the degree of help to children who otherwise might have found them beneficial.

The picture effect for the different lexemes is more difficult to explain. As mentioned previously, pictures had the effect of increasing correct responses for because, with the opposite effect for so. This was true across ages and picture conditions. One possible explanation for this interaction effect has to do with the order of mention: the so items retain the natural order of events, whereas the because items do not. As reviewed earlier, this 'violation' of event order apparently adds further complexity to the because items. It makes some sense that pictures would have a facilitating effect for the more difficult

material, but the mechanism for this assistance is unclear. Pictures were presented with the stories, not the eventual lexical probes. At the time of picture presentation, the material had not yet been identified as pertinent to because or so. Presumably the pictures helped the child create a clearer representation of the story event sequence. Such clarity might indeed prove valuable when faced with a difficult probe, but it should also have assisted with the easy probes, or at least led to no change. The decrease in performance on so items in the Picture condition requires further investigation.

Lexeme Effect

The results indicated no main lexeme effect, i.e. no difference in performance between because and so. According to some studies (Bebout et al, 1980), this should not have been the case due to the fact that with the term because as it was used in this study, the real world order of events was not preserved in the probe, and with the term so, it was. Bebout et al (1980) had found that performance on so was significantly better than performance on because, if order of events was not preserved. That is, comprehension of "Y because X" was poorer than either "because X,Y" or "X so Y". Their explanation for this difference in performance included an order of mention strategy in which children view the clause order as always being the order of occurrence. It is important to note, however, that the results obtained by Bebout et al (1980) were based on an enactment task. French (1988) was able

to replicate their findings. She also, however, recognized the influence of task type as a variable and so added a sentence completion task to the Bebout et al paradigm. In her sentence completion data, as was true for the current data, there was no difference in performance between because and so, regardless of whether the real world order of events was maintained.

How then are we to understand the original Bebout et al findings? In order to explain what might possibly be occurring it is necessary to direct attention to what was earlier described as secondary task demands. It seems possible that the enactment task might have more complex secondary task demands than the sentence completion task such that the task itself is making it difficult for children to demonstrate their knowledge of the relational terms. That might prompt children to turn to various simplification strategies, that may be child specific, one of which might be the order of mention strategy.

Informal task analysis suggests that this explanation is plausible. The enactment task requires the child to formulate nonverbal acts for both the antecedent and consequent events, and to figure out how to nonverbally portray the causal relation. The completion task requires the child to express only one of the two events, and the causal relation is already expressed by the examiner. If valid, this analysis indicates that enactment does present more demanding secondary task characteristics and might lead children to invoke order of mention strategies. This is the strategy that would lead to a greater number of errors on because

items than on so items. Further confirmation of this interpretation can be seen in the fact that the order of mention strategy (error type #1) was observed in only a few of the four and five year old children in the current study, as might be expected from the low secondary task demands of the sentence completion paradigm.

In summary, the current study did not find a significant difference in performance between because and so. This finding is in accord with the French (1988) data and suggests that earlier reports of difference in performance between because and so, by Bebout et al (1980) and others, have been the result of the use of the order of mention strategy - a strategy not inherent to a stage of lexical comprehension, but one used by some children in the face of the secondary task demands that accompany the test paradigm chosen by the experimenter.

Support for the Contextual Model

This particular study provides support for what is known as the Contextual Model of lexical development. This model posits an intermediate stage in the process of the acquisition of relational terms in which children appear to understand the term in a familiar context but fail to understand it in an unfamiliar context. As children get older they become less dependent on contextual support.

As reviewed in Chapter Two, proponents of the Contextual Model have offered two explanations for the prolonged period of

acquisition. French (1986a) argues that, at an intermediate stage of lexical representation, children can use their prior knowledge of the likely relationship between two events to infer the full meaning of a relational term. If prior knowledge is not available, children must construct an event representation and assess its probable relationships before any inference about word meaning can be made. At later stages of lexical knowledge, children are able to directly access the meaning of the relational term without reference to event representations. By this view, the difference between 'intermediate' level performance and 'high' level performance involves change in the lexical representation itself. French (1988), on the other hand, focuses her explanation on general cognitive processing demands: "the transition from context dependent to context independent understanding does not reflect further lexical development, but rather increasing facility in dealing with decontextualized linguistic input" (p. 262). Although she does not provide an extensive discussion of 'increasing facility', this change clearly involves those processes needed to interpret auditory linguistic material, on line, in the absence of accompanying events (real or pictured) or event knowledge. Such processes include memory and attentional functions of diverse sorts.

The relative merits of these two interpretations can be explored by manipulating the degree and type of support provided to the young listener. If the problem is primarily one of limited processing resources, then assistance with any aspect of the task

should lead to gains in performance. If the problem is primarily one of partial lexical representation, then only those aids that help with inferring causal meanings will prove beneficial. In the present study, familiar content could aid comprehension either by reducing processing load or by indicating the likely meaning of the relational term. Pictures, however, particularly when used with unfamiliar meanings, could only assist with processing load, not with the meanings of the lexical terms.

Unfortunately, the present findings do not ultimately allow us to choose between the alternative versions of the Contextual Model. Pictures did assist performance with unfamiliar content for the four year olds. This suggests that overall processing load does play some role in the course of development for relational terms. However, across ages and lexemes, the effect of pictured content was small and unreliable, albeit in the anticipated direction. This could be due to the specific procedures used, the relative unimportance of the process targeted for intervention, or the fact that intermediate stage lexical representations are indeed partial. Further research will be needed to further explore these alternatives.

Clinical Implications

It is important to discuss the clinical implications of this research in regards to two different issues: the development of assessment batteries in language and other areas, and future education for children including those with delayed/disordered

language.

The Development of Assessment Batteries.

There is frequent dissatisfaction with the tests or assessment methods we typically use with children. What can the findings from this study offer in terms of alternative assessment measures? Let's first consider the findings of this study. This study demonstrated a familiarity effect in which preschool children's comprehension of relational terms presented within the context of familiar events is significantly better than that of relational terms presented within an unfamiliar context. This finding coupled with age-related trends also suggested a course of development for relational terms in which comprehension for a given term occurs first within a familiar context then with an unfamiliar context. Finally, comparisons of the findings from this study in comparison to those of earlier studies clearly illustrates the effect of secondary task demands. Each of these points indicates a direction for the development of assessment tools.

What we wish to discover when using an assessment tool is the child's ability to understand/produce particular aspects of language. If the findings from this study are valid, then the type of assessment tool that would be most useful is one which would assess the child's comprehension of language forms within both a familiar and unfamiliar context. In assessing story comprehension, for example, a child could be given stories based on both familiar and unfamiliar scripts.

Secondly, this study suggests that we may need to reformulate our typical assessment questions. Rather than asking broad, simple questions about the level of functioning of a child, e.g. what does the child know? or what is the child's developmental stage?, we may need to ask focused, contingent questions, e.g. in what circumstances does the child demonstrate knowledge of causal conjunctions?

Finally, given what we know about task type and its effects (i.e. secondary task demands), we can try to minimize extraneous requirements. For example, comprehension of relational terms seems to be tapped more directly by sentence completion tasks than by enactment tasks. Review of the literature on other aspects of language may indicate the best tasks to use in assessing comprehension of other sorts of language forms.

Therapy and Classroom Education

Although this study looked at one small part of language, the comprehension of the relational terms because and so, one can make inferences about language in general based on these findings. One of the main findings in this study was that preschool children performed better with familiar material than with unfamiliar material. It seems reasonable to imagine that children go through the same decontextualization process in other areas of learning. If so, this would have wide implications for the nature of the context in which children initially learn best.

When children reach school age they are asked to do tasks that require specific prerequisite skills they must acquire. Without these skills children will have problems doing the assigned school work. These skills range from auditory memory skills to sequencing and metalinguistic skills. The findings from this study suggest that such skills be taught first in the context of familiar content, e.g. exercises in sequential memory should involve favourite foods rather than the names of African countries. Likewise, it is important for the constraints of familiarity to be observed as children learn new concepts or information. For example, one cannot expect a child to easily learn the finer details about the solar system when he does not even know what the solar system is. In this particular case the child must have already acquired a specific knowledge base about the solar system before being able to effectively comprehend new and more complex information on the solar system. With this knowledge base, the child can slot new information into already established schemes.

It is particularly important for children who may have learning disabilities or comprehension difficulties that a solid knowledge base be established. Comprehension difficulties will make it harder for that child to sort out new information and slot it into the appropriate space in his knowledge base. Therefore, a very well defined knowledge base is important for more effective learning. It is also important that new skills be presented first with familiar content. One does not wish to place a greater cognitive load on the child than he/she can handle. Therefore, if

unfamiliar context adds a greater cognitive load on the child it simply makes sense to reduce that load by introducing new concepts, skills or language forms in the context of familiar content.

Summary and Conclusion

The main purpose of this study was to investigate the comprehension abilities of preschool children with the terms because and so, as well as to determine the effect of two variables believed to influence comprehension, namely event familiarity and pictured content. Results indicated that familiarity with context increased performance on a sentence completion task, that preschoolers could comprehend causal connectives in the context of familiar events, and that comprehension performance on these terms increased between the ages of three and five. Pictures of story content did not appreciably aid the comprehension of causal terms.

These findings support what is known as the contextual model of lexical development. This model claims that the comprehension of relational terms is initially context dependent. In the course of development the child goes through a stage of decontextualization in which he/she comes to understand the term in the context of unfamiliar event sequences. Applying this model to educational practice suggests that children will learn best when new skills, information, concepts or language forms are first presented in familiar contexts. Further, if we wish to give a more thorough analysis of children's level of functioning we will need to use assessment tools which vary task type, and familiarity with

context.

The purpose of this research was not to show that other researchers were wrong or inaccurate in their results and conclusions, but rather to show that, given the right conditions, children are able to demonstrate knowledge of relational terms at a younger age than previously thought. Whether familiar contexts are useful because they aid in the interpretation of partially known terms or because they simplify the processing of complex sentences, the end result is the same - young children can comprehend because and so if they are presented in the context of familiar events. To acknowledge the limitations of this performance in no way decreases its significance. If familiar context is the only condition that elicits comprehension then that child is at a stage at which comprehension is present, but not in all situations. That invites us to characterize the environments and conditions that are most conducive to comprehension. If we take this particular attitude to all areas of language comprehension and production we may be on the way to more effectively understanding children's acquisition of language as well as more effectively inducing learning in children in both the classroom and therapy situations.

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Appendix A

STORY TEXTS

Story #1 - The Birthday Party

1. Today is Jimmy's birthday and he is having a party.
2. All of his friends have come to the party with presents.
3. Everyone is playing games now.
4. Everyone is now hungry and they eat some birthday cake.
5. Jimmy then opens his presents.
6. The party is now over and everyone goes home.

Story #2 - Getting Ready for Bed

1. It's time for Johnny to go to bed.
2. He is dirty and his father puts him in the tub.
3. After his bath Johnny puts his pyjamas on.
4. He then brushes his teeth.
5. Johnny likes books and his mommy reads him a story.
6. Johnny is tired and falls asleep.

Story #3 - Snacktime

1. It is snacktime at daycare.
2. Kim is playing with a doll.
3. The teacher says it's time to clean up and Kim puts the doll away.
4. Kim sits down at the table.
5. She drinks some apple juice.
6. Kim is now finished snack and can go play.

Story #4 - Playing in the Rain

1. Becky wants to play outside.
2. It is raining and she puts on her raincoat and boots.
3. She then goes outside to play.
4. Becky likes the rain.
5. Becky splashes in the puddles and now she is very wet.
6. Her mommy calls her to come back inside.

Story #5 - At the Playground

1. Linda is sitting in the sand at the playground.
2. David kicks sand in her eyes and she starts to cry.
3. Linda runs home and tells her mommy.
4. Her mommy washes her face.
5. Linda feels better now and goes back out to play.
6. This time she plays on the slide.

Story #6 - Going to the Park

1. It's a sunny day.
2. Nicky and his dad go to the park.
3. Nicky loves balloons and his daddy buys him a balloon.
4. Nicky is very happy.
5. He and his daddy watch the birds flying in the sky.
6. Nicky let's go of the balloon and it flies away.

Story #7 - Going to McDonald's

1. George and his mommy are going to McDonald's for dinner.
2. George's mommy gets in line to order food.
3. George is little and he gets to have a Happy Meal.
4. George and his mom sit down at the table to eat.
5. George spills his drink and he has to wipe it up.
6. They finish eating and go home.

Story #8 - Going Shopping

1. Peter is going shopping with his mother and little brother.
2. They get into the car and get their seatbelts on.
3. Peter and his brother are making a lot of noise and their mother tells them to be quiet.
4. Peter's mother parks the car.
5. Peter's mother is going to buy a lot of food and she gets a shopping cart.
6. They then go inside the grocery store.

Story #9 - Making a Date

1. Jack wants to make a date with Tina and calls her up.
2. Tina says she would like to go out with Jack.
3. Jack picks Tina up at her house.
4. Tina wants to go bowling.
5. The bowling alley is closed and they go sailing instead.
6. Afterwards Jack brings Tina home.

Story #10 - Sewing

1. Mrs. Smith wants to sew a skirt and she buys a pattern and some fabric.
2. She pins the pattern pieces to the fabric.
3. Mrs. Smith cuts the pattern pieces out.
4. She pins the sides of the skirt and the two pieces of fabric stay together.
5. She now sews the skirt.
6. Now the skirt is finished.

Story #11 - Fixing a Flat Tire

1. Jim is driving his car.
2. He has a flat and takes the spare tire out of the trunk.
3. He places the jack under the car.
4. Jim starts cranking the jack and the car lifts up.
5. He takes the old tire off and puts on a new one.
6. Jim can now drive his car again.

Story #12 - Putting on a Play

1. Lydia's class is putting on a halloween play.
2. Everyone in the play is practising.
3. They sent out invitations and everyone knows that there is a play.
4. The night of the play everyone goes to the auditorium.
5. Lydia's class has practised hard and everyone remembers their lines.
6. The play is over and everyone in Lydia's class bows.

Story #13 - In the Hospital

1. Ted is in the hospital with two broken legs.
2. He cannot walk.
3. He pushes the call button and the nurse comes.
4. Ted tells the nurse that he has to go to the bathroom and she brings him a bedpan.
5. The nurse asks Ted if he wants anything else before she leaves.
6. Ted just wants to sleep.

Story #14 - At the Horse Races

1. Jack and Mary are both at the horse races.
2. They want to bet on the horses and line up at the betting booth.
3. They each bet five dollars on their favorite horse.
4. They sit down to watch the horse race.
5. Mary's horse comes in first place and she gets to collect ten dollars.
6. Jack's horse comes in last.

Story #15 - Graduating from High School

1. Jennifer is graduating from high school.
2. Everyone gets a turn to pick up their diploma.
3. Jennifer's name is called and she marches up to the front of the auditorium.
4. The principal makes an announcement.
5. Jennifer has earned high grades and gets a special award.
6. Jennifer's mom and dad are very happy.

Story #16 - A Car Accident

1. Nelly is walking down the street.
2. Two cars crash into each other.
3. Nelly saw the accident and the police ask her questions about it.
4. No one is hurt.
5. The police want to ask Nelly more questions later and she tells them her name and phone number.
6. The policeman writes it down.

Appendix B

Questions for Story TextsTEST BATTERY #1

- Story # 1 1. Jimmy is having a party because ...
2. Everyone is hungry so ...
- Story # 2 3. Johnny is dirty so ...
4. Johnny's mommy reads him a story because ...
- Story # 3 5. The teacher says it's time to clean up so ...
6. Kim can now go play because ...
- Story # 4 7. Becky puts on her raincoat and boots because ...
8. Becky splashes in the puddles so ...
- Story # 5 9. Linda starts to cry because ...
10. Linda feels better so ...
- Story # 6 11. Nicky's daddy buys him a balloon because ...
12. Nicky lets go of the balloon so ...
- Story # 7 13. George gets to have a Happy Meal because...
14. George spills his drink so ...
- Story # 8 15. Peter and his brother are making a lot of noise so..
16. Peter's mother gets a shopping cart because ...
- Story # 9 17. Jack wants to make a date with Tina so ...
18. Jack and Tina go sailing because ...
- Story #10 19. Mrs. Smith want to sew a skirt so ...
20. Mrs. Smith pins the sides of the skirt so ...
- Story #11 21. Jim takes the spare tire out of the trunk
because ...
22. The car lifts up because ...
- Story #12 23. Lydia's class sent out invitations so ...
24. Everyone in Lydia's class bows because ...
- Story #13 25. Ted pushes the call button so ...
26. Ted tells the nurse that he has to go to the
bathroom so ...

- Story #14 27. Jack and Mary want to bet on the horses so ...
 28. Mary gets to collect 10 dollars because ...
- Story #15 29. Jennifer's name is called so ...
 30. Jennifer gets a special award because ...
- Story #16 31. The police ask Nelly questions because ...
 32. Nelly tells the police her name and phone number because ...

TEST BATTERY #2

- Story # 1 9. Jimmy is having a party because ...
 10. Everyone is hungry so ...
- Story # 2 11. Johnny is dirty so ...
 12. Johnny's mommy reads him a story because ...
- Story # 3 13. The teacher says it's time to clean up so ...
 14. Kim can now go play because ...
- Story # 4 15. Becky puts on her raincoat and boots because ...
 16. Becky splashes in puddles so ...
- Story # 5 1. Linda starts to cry because ...
 2. Linda feels better so ...
- Story # 6 3. Nicky's daddy buys him a balloon because ...
 4. Nicky let's go of his balloon so ...
- Story # 7 5. George gets to have a Happy Meal because ...
 6. George has to wipe up his drink because ...
- Story # 8 7. Peter and his brother are making a lot of noise so...
 8. Peter's mother is going to buy a lot of food so..
- Story # 9 25. Jack wants to make a date with Tina so ...
 26. Jack and Tina go sailing because ...
- Story #10 27. Mrs. Smith want to sew a skirt so ...
 28. Mrs. Smith pins the sides of the skirt so ...
- Story #11 29. Jim has a flat so ...
 30. The car lifts up because ...
- Story #12 31. Everyone knows that there is a play because ...
 32. Everyone in Lydia's class bows because ...

- Story #13 17. The nurse comes because ...
18. Ted tells the nurse that he has to go to the
bathroom so ...
- Story #14 19. Jack and Mary want to bet on the horses so ...
20. Mary gets to collect ten dollars because ...
- Story #15 21. Jennifer's name is called so ...
22. Jennifer gets a special award because ...
- Story #16 23. The police ask Nelly questions because ...
24. The police want to ask Nelly more questions later
so...