Use of Context in Question Answering By 3-, 4- and 5-Year-Old Children. Ryder, N & Leinonen, E.
Journal of Psycholinguistic Research, Vol. 32, No. 4, July 2003

Use of Context in Question Answering By 3-, 4- and 5-Year-Old Children

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This study investigates, within the theory of relevance of Sperber & Wilson (1995), how3-, 4-, and 5-year-old children (n _ 45) use context when answering questions. The children were required to answer questions that placed differing contextual and processing demands on them, as predicted by the theory. The results indicate that an increasing ability to use complex contextual information was related to age and was reflected in the children's ability to answer questions appropriately. A developmental pattern became evident in terms of how the children assigned referents, enriched semantic underdetermination, and recovered implicatures. It also became evident that even at the age of 5 years 6 months the children were in the process of becoming more skilled at integrating contextually complex inferences. It was further shown how children's selection of the appropriate context, given the focus of the question, depended on how relevance was achieved in that context.

KEY WORDS: Relevance theory; pragmatics; context; language development, questions.

INTRODUCTION

Various factors are likely to affect how a child answers a question. Children's ability to answer questions is connected both with their increasing ability to deal with the linguistic structure of questions and the pragmatic demands that the question places on the child. "Where" and "what" questions have been said to be easier for children to answer than "why" questions. (Ervin-Tripp, 1971; Tyack & Ingram, 1977). It is not, however, uncommon to find that a child can answer a question of a particular grammatical form in one context but not in another (Leinonen & Letts, 1997). In these cases, it cannot be the linguistic form that is causing the difficulty, but situational and pragmatic factors are likely to have an effect on the child's performance. When trying to understand how children answer questions it is important to consider the pragmatic or contextual demands of the questions. It has been suggested that we need to consider whether the objects that are being talked about are present or absent in the environment; whether the child has sufficient experience and world knowledge to draw upon in order to arrive at an acceptable answer; whether the child understands the linguistic meaning communicated by the question; and whether the child understands his/her role as the recipient of the question and is willing to fulfill this role (Parnell & Amerman, 1983). It has been further suggested that the contextual and cognitive processing demands that questions place on children are likely to affect their understanding of the questions and the answers that are given.

The purpose of this study is to examine the role of context in children's question answering within a theory of pragmatic comprehension, Relevance Theory (Sperber & Wilson, 1995). This theory enables one to investigate how context is utilized in comprehension and how questions place varying contextual demands on the recipient. Comprehension of language in communication requires the ability to interpret meaning in context. It is commonly held that linguistic comprehension is just one part of understanding

and that as children develop toward becoming more competent comprehenders of language, they need to become increasingly
skilled at interpreting meaning that arises in context (e.g., Bishop 1997; Milosky, 1992; Oakhill & Yuill, 1986). Milosky (1992, p. 21) summarizes the developmental process as involving "increasingly sophisticated uses of context" in which development is characterized "in terms of increasing fluidity or lack of rigidity in using context and by changes in the amount and kinds of knowledge children acquire and use for dealing with the basic indeterminacy in language." Language is indeterminate in the sense that the same expression can mean different things in different contexts and hence the linguistic expression itself is only a starting point for interpretation. Children begin to comprehend what is communicated to them by relying heavily on the physical context in which the communication takes place (Bishop 1997). Young children utilize contextual cues such as nonverbal signals, facial expressions, and the environment in interpreting expressions that are addressed to them. Children's early comprehension is contextually driven, and the developmental process can be seen to involve an increasing ability to utilize language in the comprehension process. Strohner and Nelson (1974) found that 3-year-old children interpreted meaning in terms of the likelihood of the meaning occurring in real life, whereas children of 5 were able to override the meaning suggested by real life by the meaning given by the linguistic expression. Similarly, Clark (1973) showed that when young children were asked to comprehend prepositional phrases, their knowledge of how objects usually are overrode the message given by the linguistic expression. These studies show how *early* comprehension is intrinsically linked with context and how early development involves giving the linguistic expression more salience in the comprehension process. As children develop, there is also a need for a different, more sophisticated use of context in the interpretation of language expressions. Children's use of contextual information can be considered more sophisticated when information is no longer exclusively available from the "here and now," but, for instance, from one's world knowledge or previous experience. More advanced comprehension skills are also demonstrated when available information is appropriately integrated and combined to arrive at the intended interpretation of the language expression. In this way, developmental processes can be said to involve an increasing ability to efficiently manipulate contextual information, from a number of different sources, in a way that results in an efficient recovery of the intended meaning.

A relatively basic kind of contextual operation in early comprehension involves the identification of referents in context. Person deixis (reference to oneself and others) develops earlier than the more abstract time deixis (e.g., today, yesterday). Umstead and Leonard (1983) observed that 3-year-olds were able to locate antecedents for pronouns in short stories and that this ability improved with age (3- to 5-year-olds). Nicholle (1997, p. 50) suggests that pronouns "exploit the relative mental accessibility of discourse referents so as to reduce processing effort, where their frequency of mention and their phonologically and semantically reduced nature make them easy to decode." The grammatical arrangement of the input constrains the inferential search for a referent. For example, gender constrains the search for a referent and the inclusion of tense constrains the time at which something can have occurred in relation to the utterance Blakemore, 1990). These grammatical relationships are procedurally encoded and they constrain reference assignment and some other contextual operations (enrichment, see below) (Carston, 1998). Narratives require sophisticated use of context and the ability to make links between what is said and what one knows about the world. To comprehend narratives fully one needs to be able to "read between the lines." Yuill and Oakhill (1991) found that children (7- and 8-year-olds) who performed poorly in relation to their peers on comprehension tasks appeared to be developmentally behind at keeping track of pronouns and in recovering meaning that is not expressed in narratives. In addition, when telling a story from an array of related pictures, they tended to describe each picture using present tense and focusing on the "here and now." When given the same array of related pictures, children who were skilled comprehenders were able to infer possible reasons for various actions and use different tenses and connectives to tell the story. It appeared that the difficulties experienced by the less-skilled comprehenders were related to their ability to infer (make connections), and memory was not implicated

in their poorer performances in comprehension. (Stothard & Hulme, 1992; Yuill & Oakhill, 1991) The ability to make relevant inferences enables one to see connections in narratives rather than viewing the ideas presented in them as separate or unconnected from one another.

Even though it is generally held that contextual information has an important role to play in language interpretation, and question answering, relatively little is known about how and when the ability to use context in comprehension develops in children. There is a need to examine this within a theoretical framework of language comprehension. The current study aims to investigate how children use context when answering questions about a story within the theory of relevance (Sperber & Wilson, 1995). More specifically, we aim to examine the following:
1. Whether development is characterized by an increasing ability to use complex contextual information in question answering
2. Whether this process reflects "increasing fluidity or lack of rigidity" in using context.

THEORETICAL BACKGROUND
Relevance theory (RT) provides a way of explaining how it an expression can mean more than is linguistically expressed (see also Leinonen & Kerbel1999). Thus, RT provides a means of exploring how context is utilized in language comprehension (and production). How is it that in the following exchange the adult's utterance "Your dinner's nearly ready" can be taken to mean "You cannot have an ice-cream"?

Child: Can I have an ice-cream mummy?
Adult: Your dinner's nearly ready.

To arrive at the intended interpretation, RT proposes that the following linguistic and contextual operations need to take place. This in not a complete representation of how the theory works, but rather we will focus on a few relevant aspects of it (see Sperber & Wilson, 1995 for further information).

Linguistic Meaning
The child needs to be able to work out the semantic meanings of the words involved and consider how their grammatical arrangement affects their meaning.

your a possessive pronoun; third person singular or plural (*)
dinner a noun; singular
's third person form of verb "to be" (copula) or indicating possessive form of a noun
nearly an adverb (*)
ready an adjective (*)

As is apparent from this, much more information is needed for one to
be able to know what the words themselves mean in this sentence. In this
way, the utterance can be said to be indeterminate and contextual information
is required to embellish the given linguistic information. Indeterminacy
is marked by (*).

Contextual Meaning 1 (Explicature)
According to RT, the linguistic expression now needs to undergo a number
of processes to become contextually viable.

Reference assignment

Your refers to the child (the daughter of the speaker)
Disambiguation
's Third person singular; or a possessive form
Enrichment
dinner refers to the dinner that the child is about to eat
nearly means "almost" and refers to a time in the future (the dinner time) in relation to the time of the utterance
ready means "ready to eat" and refers to the dinner being prepared to eat in relation to the time of the utterance
According to RT, we have now arrived at a more explicit meaning (an explicature), it can be summarized as follows: The dinner that is being prepared for the child (my daughter) at this moment in time, is about to be eaten in the very near future. Interestingly, the child may comprehend this meaning and yet not understand that this means that he/she cannot have the ice cream. Clearly, further processing is needed.

Contextual Meaning 2 (Implicature)
The meaning arrived at so far is not yet the intended meaning. Hence, further contextual information needs to be brought into the comprehension process. We need to engage in reasoning, on the basis of our world knowledge/ prior experience, which might include the following:
> When dinner is ready (imminently) it will have to be eaten at that time.
> Parents like their children to eat all their dinner when it is ready to eat.
> It takes a certain amount of time to eat an ice cream.
> Therefore parents may not want their children to have an ice cream before
> dinner has been eaten.

If this reasoning is then applied to the specific exchange in this example, it is possible to see how we can arrive at the intended meaning of the adult's utterance by combining the first contextual meaning (explicature) with the above contextual information via the process of education. The dinner that is being prepared for you, my daughter, is almost ready to eat. There is not enough time to eat an ice-cream before dinner is ready. Therefore you cannot have an ice cream. The outcome of this process is called an implicature. It is important to note here that the contextual operations involved in working out explicatures are less taxing in terms of the type of context utilized and the level of processing required than the operations involved in working out implicatures. (See hypotheses below.) One may ask how it is that one knows which contextual information is relevant for the interpretation of any one particular utterance, and furthermore how does one know which interpretation to choose if there are many possible ones. According to RT this is where the principle of relevance applies. This guides the receiver to the interpretation that achieves the greatest contextual support with the least processing effort. It is worth noting that it is possible that children can get to the intended meaning of adult utterances not by an inferential process, such as described above, but by the utilization of context in a more stereotypical way. For instance, in a context in which a child's request for sweets receives invariably a negative reply, the linguistic expression and the possible contextual processing attached to it may well not become activated. In such instances, what is said by the parent is largely irrelevant because the import of the utterance is entirely predictable from the question and a habitual negative reply to it.

HYPOTHESES
As is apparent in the above discussion, RT will enable one to examine the role of contextual information in question answering in a way that is amenable to empirical investigation. We can see from the theory that contextual processing is required when working out explicatures and implicatures and that differing degrees of processing are associated with the different outcomes. We therefore aim to examine two hypotheses is this study.

Hypothesis 1
There is a developmental pattern in terms of children's ability to answer questions that require increasing contextual/pragmatic processing.

In RT terms this can be expressed as follows:
1. is said to involve encoded procedural processes constraining and guiding the possibilities of meaning. This suggests that reference assignment would be developmentally prior to enrichment, which involves more processing and is not procedurally guided.
2. The processes involving implicatures are expected to be developmentally advanced because they require the use of the explicature (the reference assigned, disambiguated and enriched input) as a premise from which to build further context. This also involves metarepresentations such as assumptions of the speaker's intention, and world knowledge/experience that are then used in the reasoning process. Hence, the hypothesis is that children's ability to answer questions that involve the recovery of implicatures emerges later than their ability to answer enrichment questions.

Hypothesis 2
There will be a developmental pattern in terms of how children use available contextual information. More specifically, we hypothesize that the utilization of pictorial information when answering questions is developmentally prior to the utilization of more sophisticated contexts.

EXPERIMENT
Participants
Forty-five children participated in this study, 24 girls and 21 boys. There were 15 children in each of the three age-groups. We shall refer to the three age-groups as the 3-year-olds, 4-year-olds, and 5-year-olds, respectively. The age range of the 4-year-olds was 4 years 5 months to 4 years 8 months and 5 years 5 months to 5 years 7 months for the 5-year-olds. The range of 3-year-olds was larger than that of the other two groups, but the majority (10 out of the 15) were in the 3 years 4 months to 3 years 8 months range. One child was 3 years 11 months and the remainder were 3 years 1 month to 3 years 3 months. (Table I.)

Table I. Overall Percentage of Correct Answers as a Function of Age

Age-group	Correct Answers%	Correct Answers Mean	Standard Deviation
3-Year-olds	27	2.5	1.95
4-Year-olds	54	4.9	1.16
5-Year-olds	63	5.1	1.75

The 3-year-olds attended a playschool that was in the grounds of the infant school attended by the 5-year-olds in the study. The 4-year-olds attended a nursery school in the same area (Britain). The children had no learning difficulties and were deemed to be developing language normally, with no previous history of speech or language difficulties. The children were monolingual and from similar socioeconomic backgrounds.

Materials
A children's book (Waddell & Granström, 1997) deemed suitable for 3- to 5-year-olds by its publishers was adapted for the study. The book had pictures and text. The length of the story was slightly reduced without any loss to its overall coherence, to accommodate the attention span of the younger subjects.

The story was based around a familiar theme, a birthday party (Appendix A). The story was first analyzed in terms of the contextual processing demands placed on a person when comprehending the story, as would be predicted by RT (Sperber & Wilson, 1995). Sentences were analyzed according to whether the processing involved reference assignment, enrichment, or recovery of implicatures. Disambiguation was not included in this study because it is not possible to determine which lexical items are potentially ambiguous for any one person, without knowing the content of their semantic systems. Questions were then constructed to target the processes of reference assignment, enrichment, and recovery of implicatures. A pilot study revealed that the original number of questions (15) was too demanding for the 3-yearolds. To ensure that the task was suitable for this age-group, the number of questions was reduced to a total of nine questions: three reference assignment, three enrichment, and three implicature questions. Whereas the questions were kept as grammatically simple as possible, the questions requiring the recovery of implicatures were somewhat more complex. The full set of questions and the text given to the children can be found in Appendix A.

The questions targeting the process of reference assignment required the child to assign the correct referent to pronouns such as he or them. The referents were both verbally stated immediately before to the question being asked and supported by a picture. The referents were not ambiguous. Enrichment questions targeted the resolving of semantic underdeterminations. That is, the incomplete semantic information had to be enriched to recover the relevant meaning in the context of the story. For example, the enrichment of "bear games" referred to in the story includes only party games played with teddies at the time of this party in the story. Other semantic meanings of the word "games" are not relevant, and the enrichment is concerned with confining the meanings within the context of the story. So, the context provided by the story is used to enrich the original input to its full meaning. In this instance, knowledge of games played at birthday parties is required to have an understanding of the semantic meaning of "games," along with the understanding of the storybook party context (and pictorial evidence) which is processed on-line. To answer implicature questions, contextual assumptions that are not explicitly stated in the verbal information need to be accessed or constructed. This necessitates the use of a number of relevant contexts, namely, the story context, world knowledge and experience, pictures, and verbal information. As was described above, integration of the various pieces of information involves constructing contexts based on the assumptions made available by using the reference assigned and enriched initial information as a premise from which to build upon. In RT terms, this is the recovery of the intended meaning or an implicature.It is important to note that in narrative comprehension, the information about one character may be built upon, and understanding of one implied meaning may be strengthened, reinforced, or even eliminated by another implied meaning. In this particular story, for example, one boy, Maxie, is continually expressing bravado whilst at the same time it is implied that he is frightened at the prospect of seeing a "real bear" at the party. What Maxie is like is enforced by a number of verbal and visual messages given throughout the book.

Data Collection

Data Analysis
The data were first analyzed in terms of whether the child gave a correct or an incorrect answer to the three types of question. An answer was deemed correct if it utilized available contextual information in a way that was relevant to the story. Incorrect answers were further categorized into one of six response types. These responses reflected how the children used available contextual information. The categories 1,2, and 3 enable one to examine how children use context when they have difficulty formulating an answer to a question that requires particular pragmatic processing. These show that even though the child has not utilized the context entirely appropriately, he/she has, however, attempted to bring contextual information into the answer. Irrelevant answers on the other hand, show that the child has not managed to

utilize any relevant contexts. An "I don't know" answer may occur for a number of reasons ranging from incomprehension to lack of cooperation.Examples of the six categories can be found in Appendix B.

1. *Picture:* These were answers that utilized pictorial information inappropriately.
2. *Storybook:* These were answers that utilized the story context inappropriately. The answer referred to some aspect of the story, thus showing awareness of the context, but the aspect that was focused on was not appropriate for the particular question.
3. *Word Experience:* These were answers that utilized world experience inappropriately. The answer used information about the theme in general such as a birthday party, rather than the specific birthday party theme discussed in the story, and hence the answer was not appropriate for the specific context.
4. *Don't Know:* The child answered "Don't know"
5. *Irrelevant:* These were answers that were not supported by any relevant contextual information, including world knowledge, and hence they were completely irrelevant given the specific story context.
6. *Problem:* These were answers that did not fit any of the above categories.

Results

The children's responses were first analyzed in terms of correct answers. Interrater reliability was 0.92 for correct answers. Incorrect answers were further classified into the six response types. An interrater reliability of 0.89 was obtained by two independent raters, scoring the six response types for a sample of nine children. Results as a function o f question type and age can be seen in Fig. 1. A one-way unrelated ANOVA showed a significant effect for enrichment questions for the 3-, 4-, and 5-, year-olds (F _ 9.955 p _ .001, df 2) and a significant effect for implicature questions (F _ 3.480, p _ .002, df 1) for the 4-and 5-year-olds. The 3-year-olds had no correct answers for implicature questions (the pragmatically most demanding questions), but they showed no appreciable difficulty with the pragmatically least demanding questions (reference assignment questions). The enrichment questions, which fall between the two other types of question in terms of pragmatic processing, showed an emerging pragmatic ability in the 3-year-olds. The 4-year-olds showed an identical developmental pattern to the 3-year-olds with regard to the three question types, except that the emergent pragmatic ability now falls on the most demanding pragmatic question type (implicature questions). This in turn shows a developmental trend for the two age-groups. The 5-year-olds showed a similar developmental pattern to the other two age-groups. For each age-group, reference assignment questions produced the highest number of correct answers. However, across age comparison, a somewhat different pattern was found for the reference assignment questions, compared to the other question types. The percentage of correct answers given by the 4-year-olds in this category were near ceiling, and they produced a somewhat higher number of correct answers to these questions compared to the 5-year-olds (see Fig. 1).
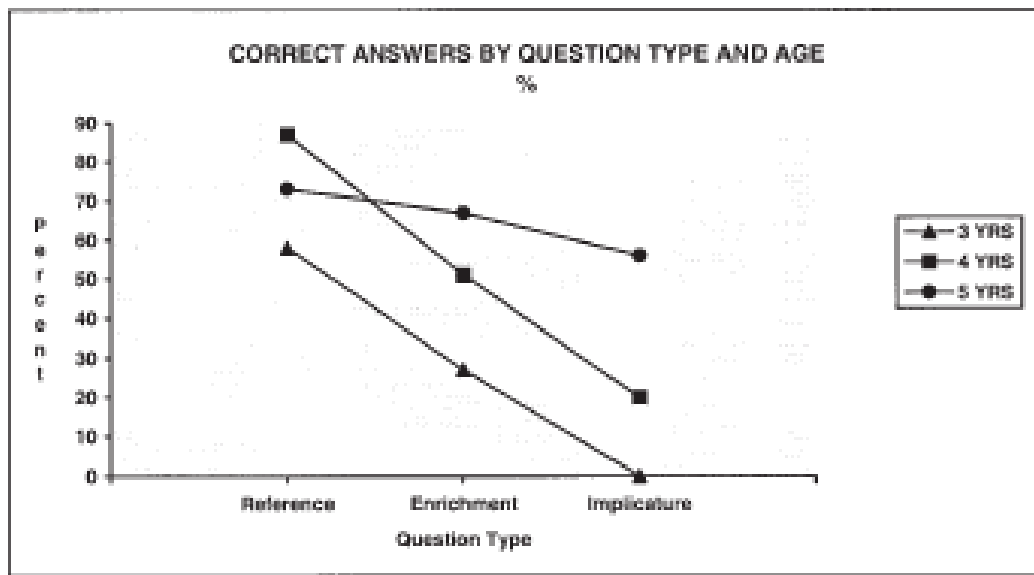
Fig. 1. Correct answers as a function of question type and age.

These results support the first hypothesis that there is a developmental pattern with regard to the 3-, 4-, and 5-year old children's ability to answer questions that show increasing   pragmatic/contextual complexity. There is an emerging ability to use more sophisticated contextual processing as a function of age. Figures 2, 3, and 4 summarize the results of the six response types used by the children when answering the questions incorrectly. The numbers of incorrect answers are not high for all the response types in all the age-groups, and hence the results need to be interpreted with this in mind. As can be seen in Fig. 2,
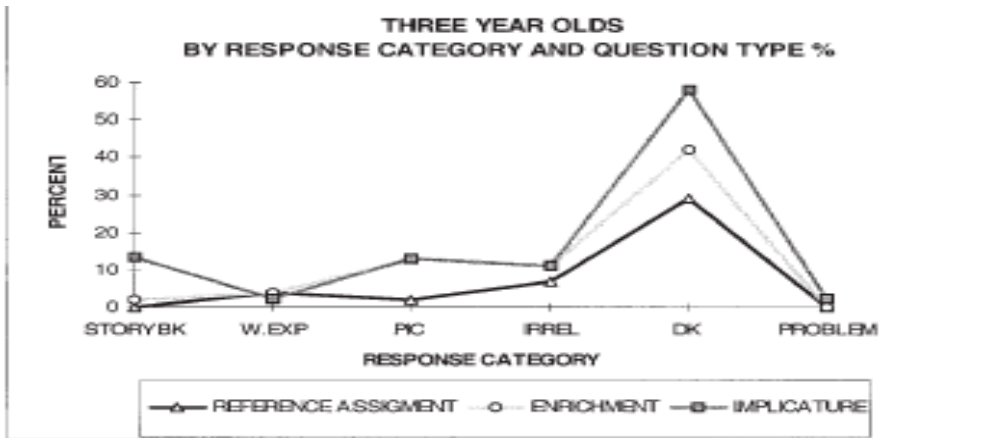
Fig. 2. Incorrect answers: 3-year-olds by response category and question type.
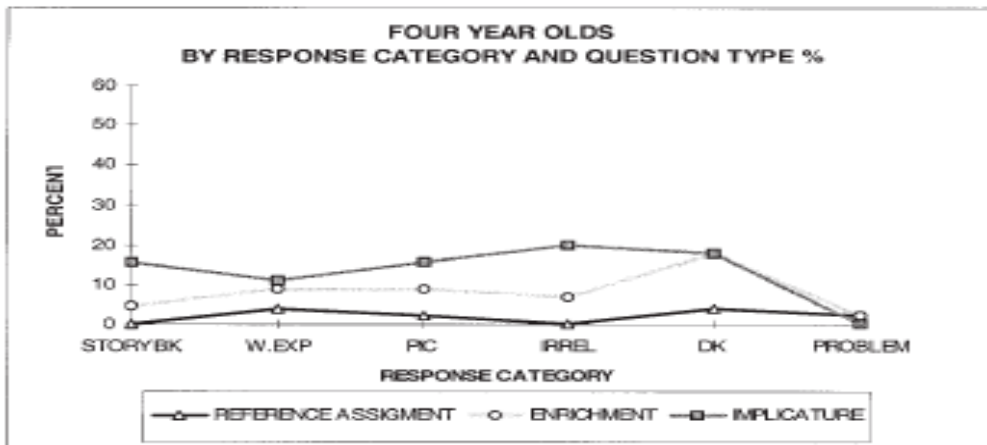

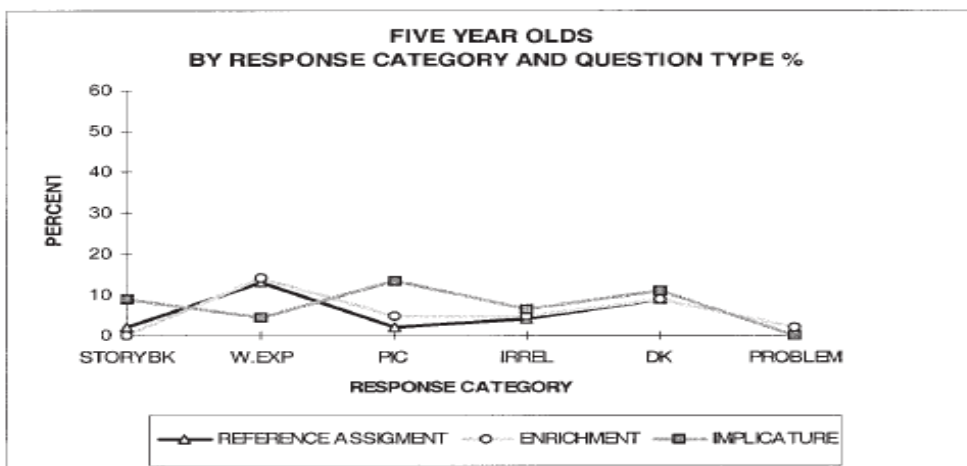Fig. 3. Incorrect answers: 4-year-olds by response category and question type.

Fig. 4. Incorrect answers: 5-year-olds by response category and question type.

which shows the type of incorrect answer given by the 3-year-olds when answering the three types of questions, the most common response across all three question types was "Don't know." For the reference assignment questions, the "Don't know" answers for the 4-year-olds were not included in the analysis (correct answers for this age-group were near ceiling) and there was no significant effect (one-way ANOVA) between the 3- and 5-year-olds ($p \_ .122$). A one-way ANOVA showed a significant effect between subjects for the "Don't know" responses to enrichment and implicature questions for the three age-groups ($F \_ 8.732$, df $\_ 1$, $p \_ .006$ and $F \_ 23.840$, df $\_ 1$, $p \_ .001$). In other words, in the case of enrichment and implicature questions the number of "Don't know' answers elicited from the children were related to the complexity of the question. This relationship between "Don't know' answers and question difficulty indicates that the children are not simply using "Don't know" because of lack of cooperation, but rather the usage reflects the pragmatic complexity of the question, and is hence potentially connected with the child's developing cognitive resources. As can be seen in Fig. 3 and 4, the 4- and 5-year-olds utilize "the don't know" strategy to a much lesser degree than the 3-year-olds. It is evident that the older children are already utilizing contextual information in their answers to a greater extent, albeit not always appropriately.

In relation to irrelevant answers, we can see from Fig. 2, 3, and 4 that no age-group provided irrelevant answers to reference assignment questions to any appreciably extent. This is not surprising in view of all the children being already able to assign referents in context, albeit to varying degrees. In other words, even the 3-year-olds do not need to resort to a strategy of simply providing an answer without trying to draw on available contextual information. As with the "Don't know" responses, the complexity of the question had an effect on the number of irrelevant responses elicited across the age-groups, thus indicating that the questions carry different levels of complexity. If we look at irrelevant answers in relation to the other two question types, we can see that the 4-year-olds utilized this strategy to a greater extent than the other two age-groups and that they did this more in relation to the most difficult question type (implicature questions). The fact that the 3-year-olds did not utilize this strategy very much is offset by their reliance on "Don't know" answers. The 5-year-olds, however, show a pattern of incorrect response types that reflect their increasing ability to utilize wider context, and hence they do not resort to a strategy that simply has a function of providing an answer. The picture, world experience, and storybook response types reflect different degrees of contextual utilization by the children. The picture responses indicate that the child utilizes the given pictorial information when it is not appropriate; the storybook answers indicate that the child utilizes the verbal information given in the story; the world experience answers indicate that the child is drawing upon knowledge/experience in an inappropriate way. As would be expected for reference assignment questions, the number of pictorial responses are low for each agegroup. But when the age-group finds a particular question type more contextually demanding (Fig. 2), they seem to revert to using the picture strategy. This kind of influence of the question type can also be seen in the case of storybook and world experience response types. As the 3-year-olds had the greatest difficulty with the implicature questions, less difficulty with the enrichment questions, and the least difficulty with the reference assignment questions, this indicates that the children were in the process of becoming less dependent on the pictures for contextual processing and were starting to move toward using the story book, but had not yet progressed toward more complex contextual processing involving the use of world experience. This is also reflected in their incorrect answers. For implicature questions the children attempted to draw upon the story and not much on their world experience. When getting enrichment questions incorrect, they demonstrated the use of story book context and world knowledge to a similar extent. We note a similar pattern for the relationship of question type and incorrect Response type for the other two age-groups. The 4-year-olds use world experience in their incorrect answers for implicature and enrichment questions, thus indicating that they are indeed moving away from processing in the "here and now". But because they find implicature questions more demanding than enrichment questions, when answering them (albeit incorrectly), they seem to revert to more contextually

available information of the story (as seen in the storybook answers). As for the 5-year-olds, an identical pattern emerges for enrichment and implicature questions. Five-year-olds were observed to have progressed to utilizing world experience in their answers to implicature questions. Similarly, their incorrect answers to the less demanding enrichment and reference assignment questions reflect this progress. But as with the other two age-groups, the incorrect answers to the most demanding question type for the age-group show a tendency to revert back to more contextually available information. That is to say that when answering implicature questions the 5-year-olds gave incorrect answers that fell into the storybook and picture response. The patterns observed provide support for the second hypothesis, which stated that utilization of pictorial information is developmentally prior to the utilization of more complex contextual information in question answering.

DISCUSSION

The aim of this study was to examine whether children's developing ability to answer questions can be characterized by an increasing ability to use complex contextual information and whether this process reflects an increasing ability to manipulate context in a relevant way. Using RT as a basis from which to investigate these possibilities, we examined the role of contextual information by using questions that targeted the processes of reference, enrichment and the recovery of implicatures. A developmental pattern was evident, suggesting that an increasing ability to use complex contextual information in question answering was related to age. This confirmed the first hypothesis. The performance of the three agegroups when answering implicature questions indicates that these questions are developmentally advanced and that the ability to integrate contextually appropriate inferences on-line starts to develop after the age of 3 years, 6 months and continue to develop after the age of 5 years, 6 months. This developmental pattern was also evident in the incorrect answers that the children gave to the different question types. The 5-year-olds produced appropriate answers to only 56% of the implicature questions. To answer the implicature questions, one needs take into account prior context, including world knowledge/experience and verbally given information. Thus the visual information given in the story book offers little by way of cues as to the implied meaning that needs to be worked out to answer the questions. As this study suggests, part of children's development of how contextual information is utilized in language comprehension involves learning to rely less on pictorial information and more on less obvious contextual information. This is important from the point of view of relevance and storybook answers, and reflects children's ability to be less rigid in their assumptions about the focus of the question, and their increasing ability to manipulate the information in a relevant way. That is, children learn not to rely solely on their own experience of an event, or the cues visually or nvironmentally available to them, but they learn to deal with the relevance of the context within which the question is focused. One pattern was observed that was somewhat counter to the first hypothesis, in which the 4-year-olds out-performed the 5-year-olds on reference assignment questions. One particular question seems to be responsible for the 4-year-olds better performance. In this particular question a cue to the answer was available from the picture and the 4-year-olds relied heavily on this cue. On the other hand, only one of the 5-year-olds used the pictorial cue, whereas the other 5-year-olds expanded the story book context, which then resulted in an inappropriate answer. This shows that the 5-year-olds were engaged in more advanced contextual processing than the other two age-groups, which in this instance, however, was not appropriate. It's almost as if the children were overusing their emerging ability to engage in sophisticated contextual processing. This kind of trade-off is in line with studies of linguistic development in which a child has demonstrated a level of acquisition and seems to regress for a period when new abilities are acquired.

This study has shown that a theory of language comprehension, RT, has enabled a meaningful investigation of children's emerging ability to use contextual information when answering questions. It has provided a way of characterizing questions in terms of their contextual and processing complexity, and thus the study has useful educational and clinical applications. A developmental trend was seen in the

children's ability to answer the three types of question investigated and in the strategies used by the children when they had difficulty answering the questions. This showed that development can indeed be characterized in terms of "increasing fluidity or lack of rigidity in using context" in question-answering. What has also been shown, however, is that it is important to constrain the fluidity within the contextual focus of the question, and hence the degree of fluidity and rigidity required in a specific context is dependent on how relevance is achieved in that context.

APPENDIX A
Text (Waddell M & Granström B 1997):
Ben was having a bring-your-bear birthday party. He told Tom and Maxie and Rosie and Sue when they were out at the swings. They said they'd all come and they told their mums and their dads. "I've never heard of a bring-your-bear birthday party before" Maxie said. Tom and Maxie and Rosie and Sue made birthday cards for Ben. Sue made a big card shaped like a bear and a much smaller card to give from her teddy bear. Rosie said Ben was having a Big Bear, a real one, at his party. "Ben's making it up"' Maxie said. The bears needed special clothes for the party. Tom and Maxie and Rosie and Sue looked in Sue's box of old dressing-up clothes for things to wear. "My bear will look best" Maxie said. "Because he's the biggest!" Sue and her mum went shopping for Ben's birthday present. They saw Tom and Maxie and Rosie at the shops. They were all looking for presents for Ben. Rosie said that the Big Bear would do tricks at Ben's party. "Big Bears don't do tricks," Maxie said. "They live in the woods". At playgroup they all sang "Happy Birthday, Dear Ben'" although Ben wasn't four until the next day. Mrs. Samara gave Ben a kiss. Ben told Mrs. Samara that a big bear was coming to his party. Mrs. Samara said she'd once seen a big bear but she'd never met one at a party. She thought a big bear might scare the teddy bears. "Not my bear, "Maxie said "My bear is brave, just like me!' At the party, Ben was dressed as Paddington Bear, with boots and a hat. There were lots of bear games, and bear eats and bear treats that were hidden. Tom and Rosie and Maxie and Sue all had to find them. "Where's Ben's big bear?" Maxie said. "I knew there wouldn't be one!" Then, the door opened and in came Ben's big bear! He went GRRRRRR! Maxie hid under the table. Rosie told Maxie not to be scared, it was just Ben's dad dressed up. "I know that" Maxie said. "it was my bear who was scared, not me". Maxie got used to the bear being there. He and Ben helped the Big Bear to do his tricks. They made Rosie's small bear appear out of a hat. "I'll do the magic words'" Maxie said. Tom and Rosie and Maxie and Sue sang, "Happy Birthday, Dear Ben," and Ben blew out all the candles on his Bear-Cake all by himself. "I like this bear party'" said Rosie. "My bear says it's the best bear party ever!" Maxie said.

Question Types
Reference Questions
Who sang Happy Birthday, Dear Ben?
What did Tom and Rosie and Maxie and Sue have to find?
Who made Rosie's small bear appear out of a hat?
Enrichment Questions
What is a bring-your-bear birthday party?
What are special clothes?
What tricks did the bear do?
Implicature Questions
Where had Mrs. Samara seen a big bear?
How did Maxie know there wasn't going to be a big bear?
Why did Maxie say it was his teddy bear who was scared?

APPENDIX B: WRONG ANSWER RESPONSE TYPES
1. *Picture:* These were answers that utilized pictorial information inappropriately. For example, when asked "What tricks did the bear do?" (an enrichment question) the child responded "it done it" whilst pointing to the wand held by the bear in the picture.
2. *Storybook:* These were answers that referred to some aspect of the story but the answer was nevertheless incorrect. For example, when a child was asked "What is a bring-your-bear birthday party" the response was "it means a bear is having a birthday party."

3. *World Experience:* These were answers that utilized world experience inappropriately. For example, on being asked the enrichment question "What is a bring-your-bear birthday party?" the child responded "it's where you have a birthday and get presents."
4. *Don't Know:* The child answered "Don't know."
5. *Irrelevant:* These were answers that were not supported by any relevant contextual information. For example, the enrichment question "What tricks did the bear do?" elicited the irrelevant answer "he got a tattoo."
6. *Problem:* These were answers that did not fit any of the above categories.
An example of a problem answer to the implicature question "Why did Maxie say it was his teddy bear who was scared?" was "it isn't a suit; it's only him" (child points to the big bear) This answer cannot be placed into any of the other categories because it appears that the child is not answering the question, but stating his/her knowledge about the big bear (storybook information) but using the term "suit" to refer to the "bear costume," which is evident from the picture (picture information).

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